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ABSTRACT

This master's research project gathered information to be used in the production of curriculum resources to support the teaching of touch-keyboarding in upper elementary classrooms. The project was undertaken on the premise that portable keyboards permit and necessitate a shift in instructional routines to foster student mastery of touch-keyboarding skills before the development of hard-to-break "hunt and peck" habits. Methods used to gather data included: a literature review on elementary level keyboarding instructional methods, a survey of upper elementary teachers to identify the curriculum components they consider most important, and a focus group discussion with keyboarding instruction experts and classroom teachers using portable keyboarding tools with elementary students. These data were used to produce a curriculum package "First Things First: A Teacher's Guide for Integrating Touch-keyboarding Instruction in the Elementary Classroom," including lesson plans, masters for overhead transparencies, worksheets and practice materials, assessment and recordkeeping tools, and a planning guide for integrating keyboarding practice into classroom routines through practical application in writing projects for other school subject areas. The final research component of this study was a pilot case study examining implementation of the curriculum in one elementary school classroom. Findings revealed that teachers who did not personally touch-key could, with preparation, teach skills to elementary grade students. Integrating touch-keyboarding skill development with other subjects was key to finding sufficient time for the program. It was important that instruction and assessment focus on technique. This case study resulted in recommendations for further research and product testing. (Four appendices include data collection and related document and the curriculum materials. Contains 51 references.) (Author/KB)

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Keys at Their Fingertips:

A Study Supporting Development of a Resource Package For the Teaching of Touch-Keyboarding Skills in Upper Elementary Classrooms Equipped with Portable Keyboards

by

Gay Wiseman

Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Science
Educational Change and Technology Innovation

Walden University

May 2000

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ABSTRACT

This research project was designed to gather information to be used in the production of curriculum resources to support the teaching of touch-keyboarding in upper elementary classrooms. Portable keyboards (sometimes called "smart keyboards" or "mini-laptops") have become available in recent years which both permit and necessitate a shift in instructional routines to foster student mastery of touch-keyboarding skills before the development of hard-to-break "hunt and peck" habits. The package of teaching materials produced as a result of this research is intended to serve as a companion piece to increasingly ubiquitous classroom keyboarding tools by providing touch-keyboarding curriculum support for elementary classroom teachers.

Methods used to gather data included: a literature review focusing on elementary level keyboarding instructional methods; a survey of upper elementary teachers to learn what curriculum components they would consider most important for keyboarding instruction support; and a focus group discussion involving both keyboarding instruction experts and classroom teachers who are already using these portable keyboarding tools with elementary students. From this data the researcher produced a curriculum package entitled *First Things first: A Teacher's Guide for Integrating Touch-Keyboarding Instruction in the Elementary Classroom*. The package includes: lesson plans for the initial phases of keyboarding instruction; blackline masters for overhead transparencies, worksheets and practice materials; assessment and record-keeping tools; and a planning guide for integrating keyboarding practice into classroom routines through practical application of the skill in writing projects for other school subject areas.

The final research component was a pilot case study which looked at one implementation of this product in an elementary classroom situation. The case study resulted in recommendations for further research and testing of the product.

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CHAPTER I

INTRODUCTION

Introduction

Young children are using computers increasingly, just as is the general population (Hoggatt, 1998). Many software programs used by children require them to enter text (Binderup, 1988). Some young children will write their very first words and sentences on a computer, and they will likely continue to use computer technology for writing throughout their schooling and beyond (Owsten and Wideman, 1997, p. 202). "There is no longer a question as to whether elementary school students will be using microcomputers. The question remaining is, 'Will elementary school students be taught keyboarding so they can operate the microcomputers efficiently?' " (Sormunen, Adams, Berg, & Prigge, 1989, p. 6). This research project was designed to inform the production of resources to facilitate the teaching of keyboarding skills in upper elementary school classrooms.

All school children should be given opportunity and support for developing proper and efficient keyboarding techniques before they are required to produce any quantity of work on a word processor (Alaska Department of Education, 1991, p. 2; Bartholome, 1997; Boyce, 1997, p. 3, Gillmon, 1991, p. 15; Saskatchewan Education, 1991). This training should not be neglected until children have developed bad habits which will be very difficult for them to break (Alaska Department of Education, 1991, p. 34; Bartholome, 1997; Boyce (1997) p. 3; Frankeberger (1985) p. 41; McLean, 1995, p. 19, Saskatchewan Education, 1991). In many schools, this neglect is occurring (Binderup, 1988, p 41; Wetzel, (1985, p. 15). Some reasons are: (a) limited equipment due to its cost, (b) scheduling problems, (c) an inappropriate reliance on keyboarding tutorial software, and, (d) teachers unprepared for teaching the skill.

Equipment and scheduling impediments are connected; schools that do not have one computer per student must share the machines they do have. A common sharing pattern has been for computers to be located in a lab, with classes using the facility on a rotation schedule. This pattern can make it quite difficult to schedule and conduct the frequent, brief keyboarding sessions which experts recommend as most likely to be successful for skill building (Bartholome, 1997, p. 9; Boyce & Whitman, 1987, p. 11; Council for Keying Education, 1993; Gillmon, 1991, p. 14).

Another computer sharing pattern found commonly in elementary schools is the distribution of the equipment into classroom clusters. Several computers are located in each classroom where they are shared by students according to a regular rotation schedule or used as needed. In such situations, hands-on keyboard training sessions cannot be conducted with the entire class at once; either multiple training sessions must be held to accommodate all the students, or "dummy" keyboards (paper photocopies, or disconnected standard keyboards) are used by most of the students during training sessions. The class time required for repeating lessons with small groups is difficult to accommodate in the crowded elementary school program (Balajthy, 1986, p. 108; Olinzock, 1998, p. 24), and the use of dummy keyboards does not provide necessary kinesthetic feedback for students as they practice keystroking; experts do not recommend their use (Balajthy, 1986, p. 108; Boyce, 1997, p. 20; Boyce & Whitman, 1987, p. 10; Hering & Held, 1998, p. 3).

These difficulties are factors that may have given rise to the reliance on software tutorials for elementary keyboarding instruction that Russin describes (1995, p. 26). Though there are many software programs now available, some of them were designed with little regard to the pertinent principles of psychomotor skill development and can actually impede learning (Bartholome, 1997; Gillmon,1991, p. 10); other programs are well-designed and do have a place in the keyboarding curriculum (Balajthy, 1988). But

no matter how well-designed, keyboarding instruction experts do not recommend complete reliance on any software program, especially during the critical initial learning period, because no software can (yet!) observe a learner's technique, eye direction, and posture (Bartholome, 1997, p. 7; Franklin, 1991, p. 124). Also, "software keyboarding instruction tends to measure short-term speed goals rather than the correct techniques needed to achieve long-term speed development" (Frankeberger, 1990, p. 14). Since keystroking technique, reliance on the sense of touch instead of vision, and correct body posture are the crucial foundations for ongoing skill development and prevention of keyboarding-related health problems, they should be the primary focus of the initial skill introduction period (Hering & Held, 1998). A live teacher, knowledgeable about both keyboarding technique fundamentals and the learning characteristics of the student group, will provide the best instructional environment for touch-keyboarding skill development (Alaska Department of Education, 1991, p. 3; Balajthy, 1988, p. 14). Bartholome, 1997; Franklin, 1991, p. 124; Boyce, 1997, p. 24; Council for Keying Education, 1993; Hering & Held, 1998, p. 1; McLean, 1995, p. 20; Morrison, 1986, p. 27).

Carolee Sormunen chaired a study in 1989, entitled *A National Study of Instructional Practices and Perceptions of Elementary School Teachers About Typewriting/ Keyboarding*. Several of the recommendations resulting from that study are pertinent to the goals of this one. The researchers recommended in part that, "elementary schools should find ways to provide equipment on a one-to-one student ratio during times provided for keyboarding instruction" (Sormunen, et al., 1989, p. 51). Low-cost, battery-operated, durable, lightweight portable keyboards have recently become available which are ideal for use in classrooms. Text keyed on these units is displayed on an integral LCD screen, is automatically saved as long as needed, and can be uploaded to a computer (or, in some cases, directly to a printer) for editing, formatting, or for use in any other computer program. Since these portable keyboards have become available, the

equipment and scheduling constraints that have made elementary grade keyboarding instruction difficult to incorporate in the school program are diminishing. This project addresses the remaining needs for teacher preparation and appropriate instructional support materials. Most classroom teachers are not prepared to conduct training in keyboard skills (Balajthy, 1988, p. 4; Binderup, 1988, p. 31; Boyce, 1997, p. 14; Sormunen, et al., 1989, p. 40). This project will produce a prototype for materials to support classroom teachers in integrating keyboard skill training into their instructional programs using portable keyboards.

There are four important reasons for supporting and resourcing a classroom-based, teacher-managed model of keyboard skill training using portable keyboards:

1. This instructional model is highly cost-effective for schools (Barrett, 1994; Whitman & Martin, 1988). The use of inexpensive portable keyboards not only can provide all students with sufficient keyboard time in order to learn and use this vital communication skill, it also can prevent the time burden of text entry tasks from monopolizing the much more expensive complete computer systems a school owns. This frees that equipment for other kinds of uses. Also, students who touch-key efficiently can produce more work in less time, enabling them to get greater benefit out of all time they spend using any computer equipment.

2. This instructional model allows the best framework for skill development (Council for Keying Education, 1993, p. 14). Teacher-directed training as opposed to student self-directed learning using either books or software tutorials is the instructional model which recognizes the crucial importance of a human observer providing feedback and correction to students as the psychomotor skill foundations are built and reinforced (Morrison, 1986, p. 27). "Effective keyboarding instruction requires close monitoring and motivation by a knowledgeable instructor. This is most efficiently carried out in whole-class instruction in a room with sufficient electric typewriters or computers" (Balajthy,

1988, p. 41). A knowledgeable instructor will recognize and correct technique problems before they become habitual and limiting to future skill development. The classroom teacher is in the best position to create and maintain an environment in which ongoing skill development is the goal, rather than the completion of specific keyboarding tasks (Franklin, 1991, p. 124; Boyce, 1997, p. 14).

3. This instructional model fosters integration of keyboard skill development with the purposes for learning the skill. The physical and temporal separation of keying and word processing that characterizes lab-based or software-managed instructional models creates a detrimental impediment to the integral use of those skills throughout all the school subject areas (Saskatchewan Education, 1991).

> Indeed, if initial training is to be reinforced effectively, the keyboard must be used in all curriculum subjects. As with any cross-curricular skill or dimension, it must be accepted as a responsibility of all staff members. This implies conscious acceptance of its worth as a life-skill for young people who will be living and working in a technological age, a recognition of its complexity, and a commitment to vigilance and supervision in the interests of the pupils' skill development. (Gillmon, 1991, p. 13)

4. This instructional model recognizes the crucial role of the classroom teacher in implementing an educational change. "When it comes to technology in education, you can create it, you can design it, you can produce it, you can legislate it.... But the bottom line is—the teachers are going to make it happen" (Goodloe, quoted in McIntosh, 1993, p. 3). The classroom teacher is with students daily and is therefore in the best position to continually monitor technique as skills are being developed and to tailor instructional patterns to the needs of individual students. The classroom teacher can weave appropriate keyboard uses regularly into assignments and projects arising from all curriculum areas so that skill development is ongoing and relevant. The classroom teacher can expect and require revision of word processed writing assignments as needed, which emphasizes quality and a process approach to writing (Balajthy, 1988, p. 41; Simic, 1994).

By the fourth grade, nearly all students have the attention span, the physical dexterity, the motivation, and the need for keyboarding skill all coming together (Boyce & Whitman, 1987, p. 2; McLean, 1995, p. 18); hence this project's objective to develop materials for use by teachers at the upper elementary grades, fourth through sixth. Postponing keyboarding instruction beyond that time will result in many students developing hunt-and-peck habits which will be very difficult for them to overcome (Binderup, 1988; Boyce, 1997, p. 2; McLean, 1995, p. 19).

In 1989, approximately 90% of elementary teachers reported that their teacher education programs had not prepared them to teach their students touch-keyboarding (Sormunen, et al., p. 47). Fourth grade teacher Diane Binderup, spoke for many of her colleagues when she wrote:

> The problem is that most of us who teach in self-contained elementary classrooms never thought we would be called upon to teach something such as typing. That was an area reserved for a few high school and vocational teachers. Even though we are increasingly aware of the necessity to teach keyboarding, we haven't the faintest idea of how to begin! (1988, p. 31)

This project aims to provide support material to help upper elementary teachers bring touch-keyboarding instruction into the pattern of their classroom programs by taking advantage of the low cost availability and scheduling flexibility that portable keyboards provide. If elementary students are not taught to touch-key effectively and instead use those increasingly ubiquitous keyboards with improper technique, they will form rigid and persistent habits which will impede their future skill development (Waner, Behymer, & McCrary, 1992, pp. 27-28). However, if teachers implement effective keyboard skill training where and when their students need it, the lifelong advantage students will accrue through efficient use of computers will be well worth the effort on the part of all educators involved.

Problem Statement

Teachers in upper elementary grades lack an instructional plan and a package of appropriate tools and resources for teaching computer keyboarding skills utilizing low cost portable keyboards within the classroom setting.

Objectives

This project will result in a teacher-friendly, research-based package of information, teaching tools, and instructional resources for supporting classroom keyboard skill instruction in the upper elementary grades. The materials will be specifically designed for use with portable keyboards.

A pilot case study of one teacher's experience using the product to initiate keyboarding instruction will be conducted to identify areas of weakness both in content and in design. This will serve as a guide for further development of the package, and will also help to identify methods for more extensive and comprehensive testing of the product's effectiveness in future.

Research Questions

The following research questions will be explored in order to meet the project objectives:

1. What curricular components will upper elementary teachers expect to find in an instructional materials package for teaching keyboarding? Responses to this question will help determine the elements to be included.

2. How should this package be organized and structured so as to be most useful and accessible to teachers? Responses to this question will help determine the format of the package materials.

3. What do upper elementary teachers already know or believe about teaching keyboarding to students at their grade level? Responses to this question will focus the

literature review on areas where teachers express gaps in information.

4. What background information, specific teaching tools, and learning resources should be included in this package? Responses to this question will help determine the instructional content and teaching tools to be included in the package.

5. How effective is a prototype of the planned package when implemented in a classroom situation? This question will provide crucial feedback for further development.

Significance

There are several elements of social significance in this project. First, it will provide tools to help schools and teachers be responsive to evolving educational purposes relative to written communications. The use of the computer keyboard has become a fundamental communication skill for everyone (Hoggatt, 1998), and writing instruction adapted to the use of keyboards will better prepare students (Gillmon (1991).

Secondly, now that these economical portable keyboards are available, it is feasible and appropriate to make touch-keyboard training a priority for all children, not just for those whose families or school districts can afford expensive computers in high ratios. These keyboards can now be had at a cost of less than $75 per student per year. The resource package produced as a result of this project is intended to serve as a companion piece to that equipment—a teacher's guide to integrating touch-keyboard skill instruction into any upper elementary classroom so equipped.

Thirdly, the use of low cost portable keyboards for keyboard training and student writing tasks has an important side benefit for schools. By removing those time intensive tasks from the time schedule for the other computer systems that a school may have, different uses can be made of those other computers. This can maximize the benefits from a school's computer investment (Barrett, 1994).

The classroom use of portable keyboards has the potential to spread the benefits of computer technology to many more students than is possible with reliance on expensive multipurpose computers alone. As with most technological innovations in schools, the key to successful implementation is in the active involvement and enthusiastic participation of teachers (McIntosh, 1993). This project aims to support such teacher involvement.

Assumptions

These assumptions underlie this study:

1. The skill of keyboarding will continue to be important for students, even though voice recognition and pen-based input technologies will undoubtedly improve (Bartholome, 1997; Highland, 1997; McKenzie, 1993; Wiggs, 1993).

2. Bad habits of keying input are difficult to break, and become a limiting factor in later computer use (Bartholome, 1997; Boyce, 1997; Condon, Hoggatt & Weston, 1989; Frankeberger, 1985; McLean, 1995, p. 19; Waner, Behymer & McCrary, 1992).

3. Most elementary classroom teachers have never received methods instruction for teaching touch-keyboarding (Balajthy, 1988, p. 40; Becker, 1994; Davison & Kochmann, 1996; Office of Technology Assessment, 1995; Sormunen, et al. 1989).

4. Software packages designed to teach keyboarding are only helpful to the degree to which a student is individually motivated to learn, and can effectively evaluate his or her own performance; for most students, and for the most effective use of school time, active teacher involvement in the instruction is crucial to success (Alaska Department of Education, 1991, pp. 11, 29; Balajthy, 1988, p. 41; Bartholome, 1997; Franklin, 1991, p. 124; Gillmon, 1991, p. 10).

Scope and Limitations

The intent of this project was to provide teachers with resources to facilitate bringing keyboard training within the scope of the typical upper elementary classroom program now that technological innovations have made this financially feasible for most schools. As technological advances continue however, the specifics of implementation in classrooms will also continue to evolve, perhaps limiting the usefulness of the materials produced by this study. The project takes place in a time of rapid technological change. Even 2 or 3 years from now, the importance of this topic may be minimized by increasing uses of other data input methods. However it is unlikely that keyboard input will become entirely unimportant for the time period during which current elementary school students will need to produce written work (Bartholome, 1997; Highland, 1997; McKenzie, 1993; Wiggs, 1993). It is probable that strong keyboard skills, once developed, will continue to be of benefit to students throughout their lives.

Though keyboard training can certainly take place in a school computer lab setting, this project focuses on training conducted within the classroom by the classroom teacher (rather than by a specialist) for reasons discussed in the introduction section.

The survey of upper elementary teachers covered a geographical area of Placer County California, and the results may not be generalizable to other populations. Also, the low response rate on the teacher survey (21%) may not constitute a large enough sample to permit generalizations.

Measures of student learning and skill development were not taken during the trial implementation of the program. Rather, the pilot case study looked only at one teacher's experience using the materials to initiate a program of keyboarding skills instruction. This data should not be considered conclusive or generalizable. It was intended to identify areas for improvement as a part of the design process. The instructional plan and package of materials produced during this study must be considered a work-in-progress; its

rigorous and objective testing in a variety of settings was not possible within the time frame of the project.

Some items in the teacher survey may have been too narrowly defined, limiting the value of the responses.

Definition of Terms

Automaticity: the level of keyboarding skill at which no conscious thought to keystroking technique is required; the practitioner is able to devote his or her attention to the content of the writing, rather than procedure (Gillmon, 1991, p. 10).

Carpal tunnel syndrome: a serious nerve disorder of the wrists, sometimes caused or aggravated by keying with the wrists under stress (National Institute for Occupational Safety and Health, 1997; Perkins, 1992, p. 29).

Home row, home keys: the middle row of keys on the *universal*, or *QWERTY* keyboard. Eight keys in this row provide the base positions for the fingertips in the touch method of keyboarding (Bartholome & Long, 1985, p. 5).

Hunt-and-peck: an inexact and inefficient method of keying which relies on visually locating the keys, and usually only employs two fingers and the thumb of each hand.

Improper technique (see also hunt-and-peck and proper technique): keyboarding habits which are likely to result in a low cap on typing speed improvement, and/or are prone to cause physical injury over time such as repetitive stress syndrome, carpal tunnel injury, neck strain, eye strain (Perkins, 1992).

Keyboarding, keying, typing: terms are used interchangeably in this document to refer to the process of entering data into a computer system by means of a keyboard

Portable keyboard: a stand-alone, platform-independent keyboard which serves as a text entry device, storing many pages of text which can later be transferred to a

computer via a cable or an infrared connection for subsequent editing, formatting and printing. Sometimes these are called *smart keyboards* or *mini laptops* though they must be distinguished from laptop computers because they do not run standard software; they are for text entry only (though some models do offer features such as spell check and typing timers). They are lightweight and durable because they have no moving parts. Most run on AA batteries (with a recyclable option) so no cords or power plugs are required. They are easy to transport in a backpack, or to store in a student desk.

Proper technique: a method of keyboarding which both minimizes the risk of physical injuries to the practitioner and opens a path to lifelong improvement in keying speed and accuracy through skill application.

Psychomotor skill: a skill that requires a combination of mental and muscle activity.

QWERTY keyboard: the keyboard layout in most common use today, sometimes called the "universal" keyboard. It is named for the first six letters in the layout.

Touch-keyboarding, touch-keying; touch-typing: these terms are used interchangeably to refer to keyboarding technique which relies on kinesthetic feedback; the practitioner strikes the keys by feel, needing little reliance on visual access to the keys or fingers (Sormunen et al., 1989, p. 4).

Upper elementary level: 4th, 5th, 6th grades in the United States education system.

Writing process (or process writing): an approach to written composition that recognizes phases for the different activities of writing such as idea generation, drafting, revising, editing, and polishing.

CHAPTER 2

LITERATURE REVIEW

A Brief History of Keyboarding Instruction

There has been a great quantity of research conducted and published on methods of keyboarding instruction since the "Type-writer" was first marketed as a commercial product by the Remington Company in 1873. It took about 25 years from the introduction of the typewriter for the *touch method* of typing to become the accepted standard. In 1888, Frank McGurrin had demonstrated in a typing contest the superiority of the skill he'd developed by typing with all 10 fingers, rather than just two or four. McGurrin was the first touch typist; he had memorized the keyboard layout and he gained great speed advantage by being able to keep his eyes on the copy material while typing, rather than having to look back and forth from copy to keys. His proficiency was a convincing demonstration of the concept of learning to type by training the fingers to memorized key locations (Gentner & Norman, 1984, p. 71).

Prior to the mid 1980s when personal computers became prevalent in homes and schools, typing skills were rarely taught before the secondary school level. High school students took typing courses for personal needs, to prepare themselves for college, or, most often, as preparation for office employment. Typing classes were offered through a school's business department, and the curriculum included instruction in the proper formatting of typical business documents.

Early personal computers relied entirely on keyboard input, and skill at typing became important for many more people. At this time however, computers were still primarily a tool for scientific and business users. It was not until the mid 1980s and the innovation of mouse input technology that the number of computer owners and users began to skyrocket. The advantages of computer technology in many spheres of human

endeavor, ranging far from scientific data analysis and business applications, became increasingly apparent. When personal computers began to be linked together through the Internet in the 1990s, they rapidly became a primary communication tool, and the keyboard remains the most efficient text entry device for Internet communications.

During the 1930s, several landmark studies demonstrated the value of typewriting for learning in the elementary grades (Haefner, 1932; Wood & Freeman, 1932). Interestingly, in those studies, touch-keyboarding skill was not taught in conjunction with typewriter use. Students were left to their own devices and typed in a hunt-and-peck manner. Yet these controlled studies did provide evidence that the use of typewriters helped advance student learning accomplishments in many subject areas. Despite the learning advantages, the difficulties of high equipment cost, equipment space requirements, and typewriter noise in the classroom are reasons why the innovation did not take hold at that time.

When computers became common in elementary classrooms in the 1980s, they were not initially used for word processing. Most were used for software which required single key responses. The interest in training elementary students to use computers as a tool for language development revived when word processing technology became widespread in the late 1980s, and gained momentum throughout the 1990s. It has become quite apparent that the student who cannot operate the keyboard efficiently is unable to take full advantage of the power of computer technology (Wetzel, 1985). Middle and high school teachers have noted that it is very difficult to teach touch-keyboarding to students who have established hunt-and-peck habits through word processor use prior to keyboarding instruction. The need to train students in touch-keyboarding has shifted down to the elementary school level, not only to enable students to become efficient computer users earlier and to gain the learning advantages from keyboard use which have been demonstrated in numerous studies, but also to prevent the development of bad habits

which will impede learning, and which may result in physical health problems over the long term.

Though many educators have recognized the need for earlier touch-keyboarding instruction (Binderup, 1988, p. 31), it has proven just as difficult to actually implement it using computers as it was in the 1930s with typewriters. Implementation problems are diminishing, however, as new equipment is developed which can make keyboard access ubiquitous and convenient.

> Computer technology and production are now approaching a level where it is both possible and practical to provide portable computing for all students. The potential of this paradigm shift from computer learning as a center-based activity, to computer learning as an integrated part of everyday life is likely to be, in its importance for education, akin to the shift from the early paradigm of reading as an activity that took place only in centers of learning, to reading as an activity that has become an integral part of everyday life. (Fung, Hennessy, & O'Shea, 1998, p. 110)

The practical and physical impediments to elementary school keyboard training have diminished, and new technologies will likely continue to minimize the difficulties of implementation. The focus is shifting to instructional methods, particularly as relate to elementary grade students. The next section presents a synthesis from the literature on how best to train children to touch-key.

Characteristics of Effective Keyboarding Instruction in Elementary Grades

One purpose of this review was to identify crucial characteristics of effective elementary keyboarding instructional programs. Though one can find controversial views on all aspects of keyboarding instruction methodology, most of the literature emphasizes the importance of the following elements:

1. Scheduling of the initial instructional course is "just in time". It takes place just before students have regular need of the skill, so that they will not have developed bad technique habits prior to receiving instruction, but not before they are developmentally

ready, and also not before they will have sufficient ongoing and regular need and opportunity to use the skill (Alaska Department of Education, 1991, p. 2; Balajthy, 1986, p. 86; Bartholome, 1997, p. 4; Boyce, 1997, p. 3; Hering & Held, 1998; Jackson & Berg, 1986, p. 8; Waner, Behymer & McCrary, 1992).

2. Instruction periods are brief but frequent (Alaska Department of Education, 1991, p. 34; Gillmon, 1991, p. 14; West, 1986, p. 83). West refers to this scheduling pattern as distributed versus massed. "A law of diminishing returns applies; the longer stroking skills practice is continued without change to a different activity, the less there is to show for the added practice" (West, 1986, p. 83).

3. Initial introduction of the letter and major punctuation keys is covered as quickly as possible, so that students begin practice using real language patterns early in the learning process (Alaska Department of Education, 1991, p. 2; Balajthy, 1986, p. 198; Condon & LaBarre, 1990, p. 31; McLean, 1995, p. 27-28; Ober, 1996; West, 1974, p. 6).

4. The instructor understands how psychomotor skills are developed, is able to demonstrate (model) proper touch-keyboarding technique, and to recognize technique problems needing correction (Alaska Department of Education, 1991, p. 17; Boyce, 1997; Boyce & Whitman, 1987, p. 5; Hering & Held, 1998; McLean, 1995). Boyce & Whitman state that it is not absolutely crucial that the elementary grade keyboarding instructor be personally skilled in touch-keying (1987, p. 5), but he or she must understand and be able to articulate why proper technique is important, and must be able to recognize technique pitfalls and correct them immediately so that they do not impede student progress. McLean says that, at the minimum, the instructor should "be competent at keyboarding, have some understanding of the developmental needs of elementary school children, and understand the rudiments of keyboarding instruction" (1995, p. 20).

Instructors should recognize the three phases of skill development common to all psychomotor learning. The first phase is cognitive, in which the rules are learned; the

second phase (the longest phase) is a gradual process of building association between the thought stimulus and the muscle action; the third phase is when a stimulus gives rise to the appropriate muscle response automatically, requiring no conscious thought (Gillmon, 1991, p. 10; Olinzock, 1998, p. 25). Consistent monitoring of student technique is crucial to prevent skill slippage until automaticity is attained. (Boyce, 1997).

5. Evaluation and assessment of learning progress emphasizes technique over speed or accuracy. Proper technique lays the foundation for ongoing skill development and is important for physical health maintenance. (Hering & Held, 1998, Hoggatt, Mann & Mastin, 1988; Perkins, 1992). This is the main reason why the active involvement of a knowledgeable instructor is crucial during the early learning period. "Evaluation must focus on correct technique, the critical teaching/learning component of beginning keyboarding, through observation of students *as they key*" (Jackson & Berg, 1986, p. 11).

6. Motivational incentives are connected conceptually with the goals for the class (Hoggatt, Mann, & Mastin, 1988, p. 39). Some keyboarding instructors make the point that motivation is not an issue when teaching elementary students to key.

> There is a difference between teaching adolescents and fourth-, fifth-, and sixth-graders. The elementary school children are eager to learn—they like using a computer—and they want to be accurate. Motivation in the elementary school is not a problem. (Morrison, 1986. p. 27)

Providing incentives (such as simply allowing students to print some of their practice exercises, allowing them time to type letters to friends or heroes, and awarding certificates of competence in keyboarding skill at a special ceremony) can be helpful motivators with elementary grade students.

7. Instruction is individualized (McLean, 1995, p. 36). One way some teachers do

this is to use a student's own handwriting speed as their initial touch-keyboarding speed goal, rather than an arbitrary words per minute standard (Miller, Smith, Fidanque, & Sullivan, 2000, p. 11; Wetzel, 1985, p. 16).

Keyboarding Ergonomics and Physical Health Concerns

The increasing prevalence of physical injuries and lasting disabilities caused by such seemingly simple motions as keystroking and mouse-clicking has necessitated instruction in physical health issues related to computer use as part of keyboard training. (National Institute for Occupational Safety and Health, 1997). "At every stage of their instruction, students must be taught to practice and maintain proper finger, hand, wrist, arm, and body position in order to remain healthy and productive" (Ober, 1993, p. 37). The importance of establishing proper touch-keyboarding technique is not only to assure keyboarding productivity; it is important for the prevention of repetitive motion injuries (Hering & Held, 1998). "There is mounting evidence that alignment of the keyboard with the edge of the desk so that the wrists are not resting on any surface will ensure that wrist problems are less likely to develop" (Boyce, 1997, p. 20).

The Literature Review as Foundation

Information gathered from this review of literature on keyboarding instruction identified key concerns which should be addressed in any keyboarding curriculum. It also identified specific topics to be addressed in the subsequent focus group discussion. The curriculum package produced as a result of this research project was built on the foundation provided by this analysis of the published work of others in the field.

CHAPTER 3

METHODS

Overview of the Methods

Several research methods were used to determine the form and content of a product that would likely be both useful and actually used in implementing keyboard skills instruction with portable keyboards in upper elementary classrooms. In addition to a review of literature, these other methods were employed: a written survey of a geographic sampling of upper elementary classroom teachers; a virtual focus group discussion involving both keyboarding instruction experts and classroom teachers who teach keyboarding to their own students; a content analysis of commercial resources for classroom keyboarding instruction; and a pilot case study of one teacher's use of the prototype product.

Written Survey

Teachers of upper elementary grade students were surveyed to determine these things: (a) what resources they consider to be most important in a keyboarding curriculum, and, conversely, what resources would they not make use of, even if they had them; (b) what form and organization of the product would be most useful to them; (c) what attitudes and beliefs they hold about keyboarding instruction in general, keyboarding instruction methods, and the skill's importance for their own students; and, (d) the current status of keyboarding instruction at their schools.

Participants and Process

The sample population was geographically-based; all 4th, 5th, and 6th grade public school teachers in the region of Placer County, California, east of the city of

Rocklin, were requested to participate through an invitation sent to school principals. A prior phone contact with the school office was made to confirm the name and mailing address which should be used for sending the materials to each principal. This phone call also ascertained the number of teachers at the target grades in each school for whom survey forms would be provided. An information letter to the principal describing the project, a response postcard to be returned by participating schools to the researcher, and the actual survey instruments were then mailed to each principal for distribution at the school site. These items are included in Appendix A. Teachers were also provided with a postpaid pre-addressed return envelope and were asked to mail their survey forms back to the researcher within one week of receiving them.

Survey Instrument

The survey instrument, designed to take less than ten minutes to complete, consisted of one page with items on both the front and back. It was tested by four elementary teachers outside the sample population; all four of the testers completed the entire survey in either seven or eight minutes. A note attached to the instrument asked teachers in the sample population to give priority to the items on the first side if they did not have time to respond to all questions.

These types of items were included, presented in the order of their importance to the study:

1. A list of possible resources and tools for teaching keyboarding, which respondents were asked to prioritize. There was an option to add items to the list, and a request that they line through any items on the list they would *not* use even if provided.

2. A multiple choice question about the preferred format of those resources.

3. A section of opinion statements, for which the respondents were asked to indicate agreement, disagreement, or no opinion. Respondents were requested to write in

additional information to clarify their responses if they wished, and space was allowed for such commentary.

4. Multiple choice questions about whether and how keyboarding is currently being taught in their school. Though this last question was not identified as a research question in the project proposal, it was asked in order to provide context that might illuminate other responses made in the survey.

Virtual Focus Group

This Internet-enabled variant of a focus group discussion brought together, via the medium of email, a roughly equal mix of keyboarding instruction experts and upper elementary teachers, all of whom had some experience teaching touch-keyboarding to elementary school students using portable keyboards. The purpose of the discussion was to identify elements which should be included in a resource package for teachers who are new to teaching the skill, or who are new to the use of portable keyboards for classroom keyboarding instruction. Questions addressed these topics:

1. Teacher preparation for initiating a program of keyboarding instruction.
2. How keyboarding "fits" in the classroom program at the upper elementary level.
3. Physical health matters related to keyboarding in general, portable keyboards specifically.
4. Traditional and alternative keyboarding instructional methodologies suitable for elementary students using portable keyboards.
5. Keyboarding skill assessment—importance, methods, and tools.
6. Methods for helping hunt-and-peck typists learn to touch-key.
7. Error correction instruction.
8. Peer monitoring of technique.

9. Classroom management routines and tips for using portable keyboards.

Participants were encouraged to bring up relevant matters not introduced by the researcher, so other topics did enter the dialogue as well. The questions asked of the group are provided in their entirety in Appendix B.

The Participants

The researcher invited participation for this phase of the study from a database of 72 individuals who were identified during the literature review process. They were all

- authors of contemporary published work in the field, or,
- authors of Web sites or curriculum material on keyboarding instruction, or,
- authors of significant contributions to internet listserves or discussion groups on keyboarding instruction topics, or,
- recommended by others as experts in the field, or,
- recommended by others as active practitioners of elementary level keyboarding instruction using portable keyboards.

An email address was obtainable from the source of the reference for 28 of these potential participants. These people were sent an email message which described the project and invited their participation. The text of this invitation message is included in Appendix B . Since the focus group was to be conducted entirely via email technology, this means of soliciting participation screened out any persons who were not using this medium and whom, therefore, would not be able to participate even if they were willing and qualified in all other respects.

The initial invitation message described the study process and the time commitment that would be expected of participants. It also asked potential participants to reply to questions about their amount of experience with each of several qualification factors, the grade levels they had taught, the approximate total numbers of students they

had taught, as well as their own willingness and ability to participate. These questions were asked in order to provide the researcher with quantitative data regarding the collective experience of the group, and also to provide a basis for ranking the participants if more than twelve individuals met the minimal qualifications. Just eleven qualified respondents replied to the invitations indicating their ability and willingness to participate, so the ranking system was not required and was not implemented.

The Process

The focus group discussion took place over the period between September 24, 1999 and October 15, 1999. The researcher posed a series of five questions, one at a time, via email messages. Participants were requested to email their responses to the researcher within three days of receiving each question. The researcher then compiled a summary of the responses and shared it with the group before posing the next question. Comments and discussion on prior questions and responses were encouraged throughout the discussion period.

Participants' identities were not known to each other. Email messages were sent out with the researcher's own address in the "To:" line, and all the participants' addresses listed in the "Bcc:" (blind carbon copy) address line. Each individual's comments remained anonymous throughout the discussion, since they were sent to the researcher before being shared with the group in the form of the summaries. This moderated discussion process was used to prevent any possibility of unhelpful or distracting comments from detouring the discourse from its purpose.

At the conclusion of the dialogue, the researcher used spreadsheet software to collate and tally comments made on each topic discussed. A narrative description of the data is provided in Chapter 4.

Content Analysis

This research component was intended to provide teachers and school decision-makers with information on keyboarding instruction tools and resources which might supplement the resource package produced as a result of this project. The researcher used the World Wide Web to identify some current sources of portable keyboards and keyboarding curriculum material. Software tutorials for keyboarding instruction were not included in this analysis because most software requires a full computer system, and cannot be run on the portable keyboards with which this project is concerned. Some recent models of portable keyboards do provide keyboarding tutorial software as an option. This option is noted in the list of features for those models, though the quality of the software has not been reviewed.

The following data was gathered for each portable keyboard identified: (a) cost per student per year (determined by dividing the price per machine when purchased in a quantity of 25, divided by the number of years covered by the manufacturer's warranty); (b) type of power source; (c) list of features beyond the basic text entry and uploading capability; and (d) supplier contact information.

The following data was gathered for several keyboarding curriculum products suitable for classroom use with portable keyboards: (a) cost of purchasing the program for a class of 25, (b) supplier contact information, and (b) a point rating. Points were assigned by the researcher for each of the following characteristics which the literature review and focus group research components had identified as crucial features of effective instructional programs:

1. Quick introduction of all the letter and major punctuation keys, followed by extensive practice involving typical grade level language patterns.
2. Effective presentation of posture and technique fundamentals
3. Emphasis on technique over speed or accuracy.

4. Appropriate content and presentation for students in the upper elementary grades.
5. Motivational incentives pertinent to learning goals.
6. Inclusion of material on physical health concerns relative to keyboarding.
7. A pattern of brief, frequent lessons.

No attempt was made to be exhaustively complete in identifying and comparing all available models of keyboards and curriculum materials. The purposes of this analysis were to provide information that would enable potential users to recognize features they should compare when considering a purchase, and also to provide contact information for suppliers.

Pilot Case Study

After the literature review, the teacher survey, and the focus group discussion had been completed, the researcher produced a touch-keyboarding curriculum package based on information gathered during those research phases. This prototype package, entitled *First Things First: A Teacher's Guide for Integrating Touch-Keyboard Training in the Elementary Classroom,* was then subjected to a pilot case study as a usability test. This was intended to provide feedback both on the instructional content of the materials and on its organizational and design features.

The design of the case study specified that the subject teacher meet these criteria:

1. Must be currently employed as a 4th, 5th, or 6th grade teacher in a school geographically near the principal researcher so that interviews could be easily arranged.
2. Must have little or no experience teaching keyboarding.
3. Must have access to a class set of portable keyboards for student use during the case study period.

4. Must be in a position to initiate a program of keyboarding instruction during the time period required by the study.

A teacher who met these requirements was recommended by a colleague in the Sacramento region *Computer Using Educators* affiliate group. That potential subject was contacted via email. She agreed to participate, obtained the support of her school administration, and signed the consent statement (included in Appendix C) on February 4th, 2000, when the project materials were delivered to her by the researcher. The identity of the subject will be held confidential by the researcher as promised in the consent document, but is available to the Walden University project committee for verification purposes as may be required.

As part of the consent process, the subject agreed to: (a) spend a minimum of one hour reviewing the materials prior to initiating the program of instruction; (b) make notes about any errors found in the materials, of questions which might arise while reviewing the package, and of the amount of time spent preparing for instruction; (c) become comfortable with the operation of the portable keyboards to be used by students during the program; (d) initiate touch-keyboarding instruction using the materials; and (e) meet with the researcher on two occasions at a consensual time and place for interviews of approximately 30 minutes duration.

The data collected in the case study was of these types:

1. Answers to questions asked by the researcher in the two interviews. (The interview questions are included in Appendix C.)

2. Descriptions of the subject's ability to correctly demonstrate various touch-keyboarding techniques.

2. Descriptions of the ease or difficulty with which the subject located various parts of the package when requested.

The subject was provided in advance with a form for keeping notes while reviewing the materials ("Reviewer's notes", included in Appendix C). This form also described the tasks the subject would be asked to demonstrate for the researcher.

Summary

These data gathering methods, taken together, were intended to provide the researcher with the a design blueprint for a touch-keyboarding curriculum package for the elementary classroom. The written survey of teachers was employed primarily to gather information about the form and organization of the product that would be most useful to its intended users. The focus group discussion was employed to determine the informational content that should be included in the product, adding the perspective of active practitioners, familiar with the features of the new portable keyboards, to the information synthesized from the relevant literature on keyboarding instruction. The content analyses assembled data on current models of portable keyboards, and on currently available teacher-directed keyboarding curricula, as additional resources for users of the product. Once the prototype curriculum package was created, the pilot case study was employed as a usability test.

CHAPTER 4

RESULTS

Results from the Teacher Survey

Survey instruments were sent to the principals of 19 schools identified in initial phone calls as willing to participate. The total number of 4th, 5th and 6th grade teachers at these 19 schools equaled 151. Of this potential sample population, 32 teachers returned completed surveys, for a response rate of 21%. All of these respondents completed both sides of the survey instrument.

Teachers' Preferences for Keyboarding Instruction Resources

In the first section of the survey, teachers were asked to imagine that their school had decided to implement keyboarding instruction for all students at their grade level and had acquired portable keyboards for each student in that grade. They were asked to choose five items from a list of 14 resources which they thought would help prepare them to begin implementing keyboarding instruction with their own students during the subsequent school term. Space was provided for respondents to list additional resources they would find helpful. Next, teachers were asked to line through any of the listed items which they would not use even if they were provided. Finally, they were asked to identify the one item which would be most useful to them if they could only have one.

Figure 1 illustrates the collective responses to this portion of the survey. Each resource item is listed on the left, as it was described in the survey instrument. The length of the white portion of the bar to the right of the axis indicates the number of teachers who selected that item as one of their five choices. A shaded portion at the far right end of a bar indicates the number of teachers who prioritized that item as the one they would choose if they could only have one. The solid bar to the left of the vertical axis shows the number of teachers who lined out the item, indicating they would not use the item even if

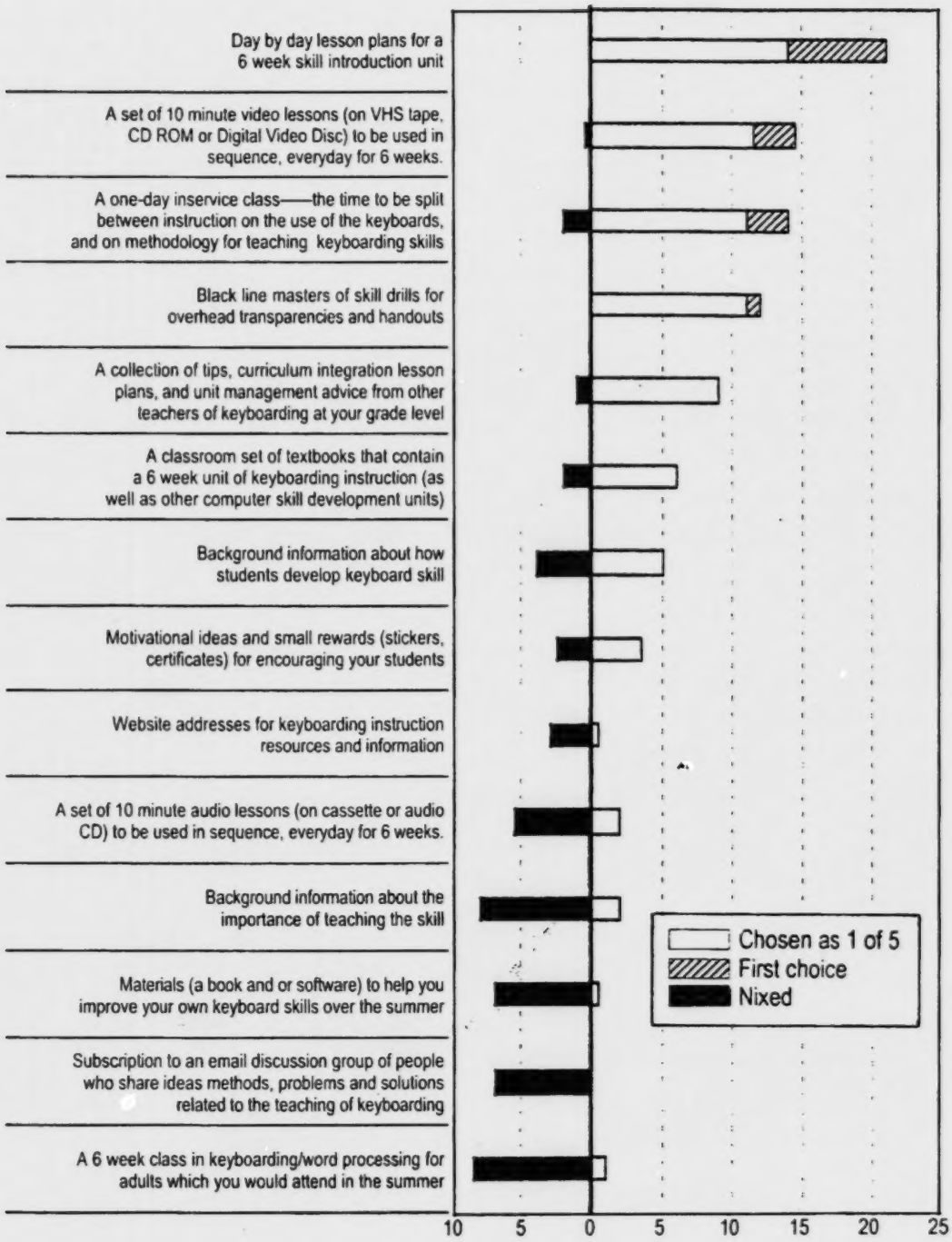
Day by day lesson plans for a 6 week skill introduction unit
A set of 10 minute video lessons (on VHS tape, CD ROM or Digital Video Disc) to be used in sequence, everyday for 6 weeks.
A one-day inservice class——the time to be split between instruction on the use of the keyboards, and on methodology for teaching keyboarding skills
Black line masters of skill drills for overhead transparencies and handouts
A collection of tips, curriculum integration lesson plans, and unit management advice from other teachers of keyboarding at your grade level
A classroom set of textbooks that contain a 6 week unit of keyboarding instruction (as well as other computer skill development units)
Background information about how students develop keyboard skill
Motivational ideas and small rewards (stickers, certificates) for encouraging your students
Website addresses for keyboarding instruction resources and information
A set of 10 minute audio lessons (on cassette or audio CD) to be used in sequence, everyday for 6 weeks.
Background information about the importance of teaching the skill
Materials (a book and or software) to help you improve your own keyboard skills over the summer
Subscription to an email discussion group of people who share ideas methods, problems and solutions related to the teaching of keyboarding
A 6 week class in keyboarding/word processing for adults which you would attend in the summer
Chosen as 1 of 5
First choice
Nixed
10
5
0
5
10
15
20
25

Figure 1. This chart depicts the sampled teachers' preferences for touch-keyboarding instructional resources. The dark vertical line is the axis.

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it was provided to them.

Items which were written-in by respondents are not depicted in Figure 1 but are listed here, just as written:

1. a specialist to teach this class (ha ha—joke)
2. a shorter keyboarding class—say 3 weeks—would be more practical for me [Marks on the form indicate this teacher is referring to the length of the class for adults, rather than the length of instruction for students.]
3. guide for grading or computer-generated scoring
4. a qualified instructor!
5. set grade level expectations & overall goals
6. competencies?
7. computers that all work

Teachers were next asked to select which of three formats for keyboarding instructional materials they would prefer. No option for suggesting other possible formats, or for modifying those listed, was explicitly given in this item, which may limit the usefulness of the data. The breakdown of responses is shown in Table 1.

Table 1

Teachers' Preferences Regarding the Format of Keyboarding Instruction Materials

Format Preference	Total	Total
Binder organized with tabbed sections	21	66%
CD ROM with printable files (including audio or video lesson segments for classroom presentation)	3	9%
Set of floppy discs with printable files, and a preprinted description of the contents with index to the disc files	8	25%
Total	32	100%

Teachers' Opinions on Keyboarding Instruction Topics

The next section of the survey asked teachers to express opinions about aspects of keyboarding instruction. Respondents were asked to indicate agreement or disagreement with each of nine statements; they were asked to leave an item response space blank if they had no opinion about it. 32 teachers completed this portion of the survey. The statements and responses are depicted in Figure 2.

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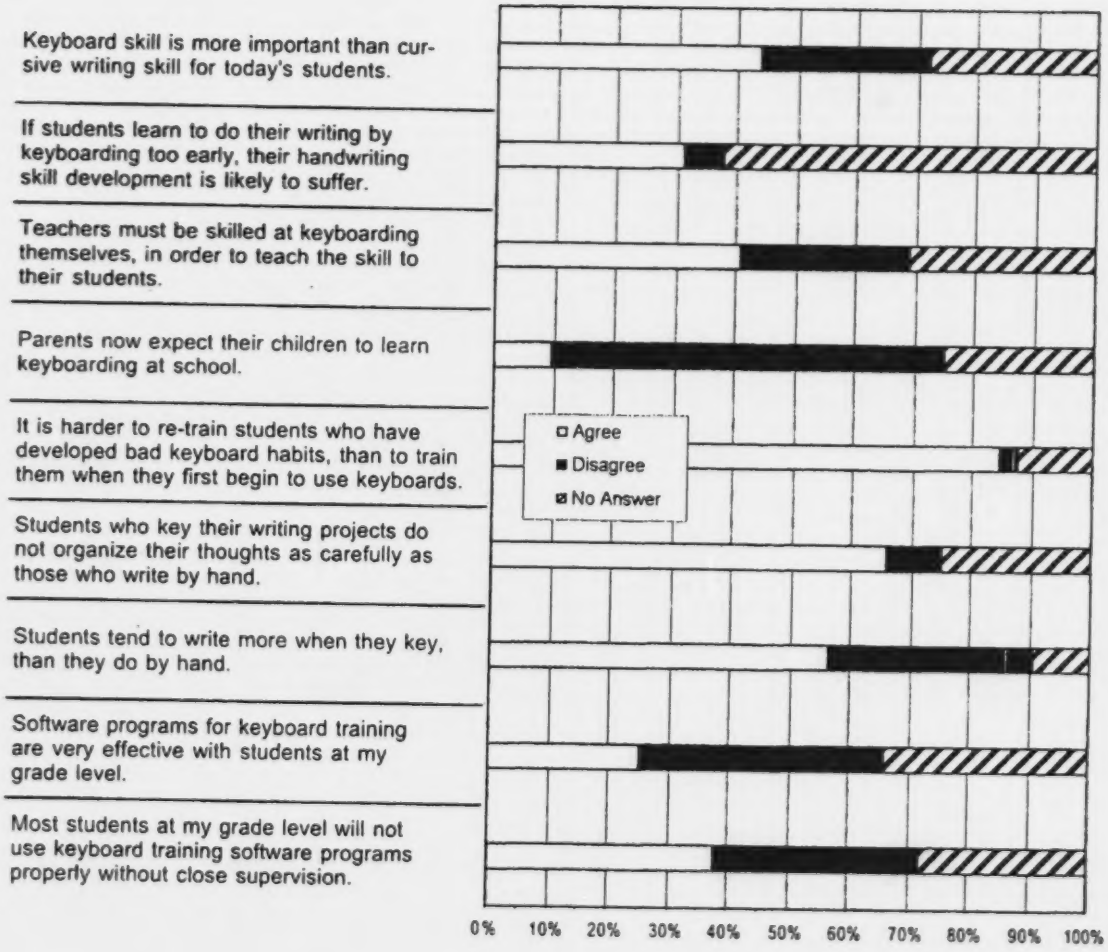
Keyboard skill is more important than cursive writing skill for today's students.
If students learn to do their writing by keyboarding too early, their handwriting skill development is likely to suffer.
Teachers must be skilled at keyboarding themselves, in order to teach the skill to their students.
Parents now expect their children to learn keyboarding at school.
It is harder to re-train students who have developed bad keyboard habits, than to train them when they first begin to use keyboards.
Students who key their writing projects do not organize their thoughts as carefully as those who write by hand.
Students tend to write more when they key, than they do by hand.
Software programs for keyboard training are very effective with students at my grade level.
Most students at my grade level will not use keyboard training software programs properly without close supervision.
Agree
Disagree
No Answer
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Figure 2. Results from the opinion portion of the teacher survey.

Results from the Virtual Focus Group Discussion

The full text of the questions posed to the focus group is in Appendix B. The data from the discussion presented here is organized according to the list of topics as was described in Chapter 3. Each section recounts the data which addressed that topic, whether it came from a direct response to the related question or at some other point in the discussion. The group participants are referred to by code numbers to preserve anonymity.

Teacher Preparation for Keyboarding Instruction

The first question asked whether teachers who do not personally touch-key can effectively teach the skill to their students, and if so, what preparation, background information or support materials they should have. Eight of the eleven group members responded to this question. All but one said that a teacher who does not touch-key personally can effectively teach the skill, but they emphasized that training is necessary. "I am familiar with a great number of situations like this—in all cases, the teacher without mastery of touch-keying was as effective as those who did have mastery." (VFG expert #2, email, September 26, 1999).

The one dissenting opinion focused on the term *effectively*. That person made the point that teachers who are required to teach keyboarding will lack a crucial enthusiasm, even if they do receive training. "The teacher may be able to teach the class, but not 'effectively' in my opinion.... Teaching keyboarding should be done by a teacher who is enthused about the skill, and is able to do the skill well" (VFG expert #3, email, September 26, 1999). This respondent recommended that specialists be employed to teach keyboarding.

Other group members responded to that point of view by asserting that classroom teachers not only can teach the skill, but they are the best people to teach their students keyboarding. These points were made in their responses:

• Classroom teachers are used to teaching beginning skills of all kinds to students at their grade level; keyboarding shouldn't be considered exceptional. "Teaching keyboarding is a challenge, but no more so than teaching them to do anything else. Actually it's easier than many things that we teach. It's full of rote memory/practice and really involves no higher level thinking skills" (VFG expert #5, email, October 12, 1999).

• The classroom teacher will be on hand to provide the necessary follow up monitoring of technique after the initial instruction period. Ongoing, consistent technique monitoring is crucial until automaticity is attained, and the classroom teacher is in the best position to provide that routinely (VFG expert #9, email, September 27, 1999).

• A teacher who is not personally skilled in keyboarding can turn that deficiency into an instructional positive by modeling the learning process for students. One teacher pointed out that the learning process is basically the same for people of all ages, that students are motivated by the idea that they are learning an adult skill such as keyboarding, and that by learning along with her students she was more empathetic to their struggles.

> I was able to anticipate points when frustrations would peak or discouragement set in. I regularly kept my students updated on my own typing speed and accuracy so they could see that it went up, down, and developed plateaus just as theirs did. (VFG expert #8, email, September 26, 1999)

• Two people mentioned that teachers with poor skills can be highly effective in motivating their students to learn, because they understand on a personal level the need for better skills, and also understand how important it is to develop a foundation of proper technique which will allow for ongoing skill development (VFG expert #11, email, September 25, 1999; VFG expert #2, email, September 27, 1999).

Recommendations for the training a teacher should have before teaching keyboarding emphasized that it should impart an understanding of the importance of proper technique. Specific approaches for learning about technique ranged widely however. Several recommended self-training to touch-key using a software tutorial (*Type*

To Learn, and *Typing Tutor* were mentioned specifically); others stressed the importance of having a live teacher to model, observe, and correct technique during the learning process; one person recommended enrollment in a graduate level methods course; several recommended keyboarding instruction workshops available to teachers as inservice training (a program mentioned specifically is offered by Learning Concepts Institute of Eugene, OR.); one person recommended observation of skilled keyboarders; one person recommended the guidance provided in the *Elementary/Middle School Keyboarding Strategies Guide*, published by the National Business Educators Association. Several people mentioned that it is important for teachers to understand how psychomotor skills in general are developed; they stressed that teacher training should include that information.

Two keyboarding textbooks designed for elementary age students (*Paws Presents Computer Keyboarding, 2nd Edition,* published by South-Western Publishing Co., and *I Can Keyboard,* published by Glencoe/McGraw-Hill) and two software programs (*Type To Learn* from Sunburst, and *Typing Tutor,* from Simon & Schuster) specifically designed for this age group were recommended. Both of the texts are out of print, but both of the software programs are currently available. One complete keyboarding curriculum package which includes texts, software, assessment material, and an instructional video was also recommended (*Almena Keyboarding,* currently marketed under the name *Typin's Cool,* and published by Typin's Cool of Ottawa, Ontario, Canada).

Accommodating Keyboarding Instruction Within the Classroom Program

The second question asked respondents to explain how keyboarding instruction can be fit into the crowded elementary school program. Nine of the eleven group members responded to this question.

Most of the respondents said that time should come from the Language Arts/ Writing curriculum, because that is where the most time benefits will be gained once

keyboard skills are established. One teacher elaborated, pointing out some side benefits of keyboarding instruction that are especially relevant to the Language Arts curriculum:

> Keyboarding should be a part of the language arts program as much as learning to print or write in cursive is. Whatever time is used up learning to keyboard at the beginning of the year is more than made up for by the end of the year. I have found that as students learn to keyboard, they begin to pay more attention to spacing between words and sentences in their handwriting. Margins and paragraph indentations also become more apparent. . . . They begin noticing formatting conventions in various print and electronic media. As students use more word processing, spelling tends to improve as spell checkers will repeatedly highlight a misspelled word. Having to choose between several choices repeatedly tends to help more visual students memorize spelling of their more commonly misspelled words. (VFG expert #8, email, October 4, 1999)

Another teacher includes keyboarding instruction in spelling lessons.

> When it became a part of my spelling lesson each week then I didn't have to find the extra time to put it into the day. I don't leave out anything, I just use a different method of teaching in that subject. This way I integrate [it] into the already existing curriculum. (VFG expert #4, email, October 6, 1999)

Others also mentioned that keyboarding instruction should be integrated within the other school subject areas. One person pointed out that the use of technology is now required under many state standards, and time spent learning to keyboard meets the technology content requirements (VFG expert #11, email, September 29, 1999). Another person wrote of a district that used Social Studies lesson time for initial keyboarding instruction since students would later use their keying skills for their reports in that subject area (VFG expert #7, email, September 28, 1999). Another suggested that all computer time should be designated for keyboarding instruction until students reach an acceptable level of skill (VFG expert #1, email, September 28, 1999). Several stressed that the time needed to establish keyboarding skill is not significant when considered in light of the time saved on writing tasks once skills are developed.

There was also this related comment:

> Based on my experience, the real concern is not the time to teach the skill. The time to prepare to teach—is the real issue. Most of the teachers I have interviewed talk about the time it takes to "find" materials they need in teaching. (VFG expert #9, email, September 27, 1999)

The writer went on to say that a good inservice program for training teachers to teach keyboarding should provide all the necessary teaching materials and this would eliminate that problem.

Physical Health Concerns Related to Keyboarding

Eight of the eleven group members shared thoughts on this topic. All eight stressed the importance of proper posture when learning to keyboard. Several people pointed out that during the initial learning period, consistent positioning of the body is crucial to developing accuracy, and to instilling habits of body positioning that will not lead to later health problems such as carpal tunnel syndrome. "Keyboarding MUST be learned by using good techniques—including using a DESK (period)" (VFG expert #2, email, October 1, 1999).

Three of the eight said that once a student has learned to touch-key, occasional keying in unconventional positions for short periods (sitting on the floor, in a beanbag chair, or with the keyboard on the lap) is not a problem.

Two people said they teach their students exercises which will help them avoid repetitive stress injuries from keyboard use, and one of them includes instruction in maintaining vision health and in minimizing the spread of infections which may result from sharing of keyboards:

> Midway through the first lesson I ask students to turn off keyboards, turn chairs towards me and lead them in several exercises to relax muscles such as letting arms hang straight down and shaking the hands loosely, single shoulder rolls, double shoulder rolls, slow neck rolls, slow twist and stretch from the waist/hips, and a seated waist curl til hands are flat on floor. They are then free to stretch as needed as long as keyboarding is primary activity. As they realize that these breaks are in their control, students complain less and within several sessions can type for 30 to 40 min. I also encourage them to change to a long distance visual

> focus every 10 minutes or so for 20 or 30 seconds. We also discuss how many people use the keyboards and the importance of handwashing to prevent the spread of germs. (VFG expert #8, email, October 4, 1999)

Keyboarding Instruction Methodologies for Elementary Students and Portable Keyboards

The group was asked about the keyboarding instruction methods they had used with elementary students. By way of introducing this topic, several methods were briefly described. The first was the most common method of teaching the letter keys in which the home row letters are taught first, and the other letters are introduced a few at a time over six to ten weeks, with practice material each session limited to those keys already introduced. Alternative methods introduce the letters by *finger zone stairsteps* (diagonal columns of keys operated by a single finger), by rows, or by alphabetical order; these alternative methods typically introduce the letters at a faster pace, sometimes using mnemonic devices to help students remember the fingering patterns.

The group was asked to share any personal experience they have had teaching keyboarding with any of the alternative instructional methods, and if they had none, to share the pacing and sequence of letter key introduction with which they have had most success with elementary age students. They were then asked to recommend an ideal schedule for an introductory course of keyboarding, assuming equipment was available in the classroom for use any time.

Eight of the group members contributed their thoughts on this topic. Only one of them had personal experience with an approach other than the traditional one. That teacher uses a keyboarding curriculum package centered around a video program which introduces the keyboard layout and letter fingering in a single lesson (repeated several times as needed) using a mnemonic story to help kids memorize everything (VFG expert #4, email, October 6, 1999). That package also includes a variety of reinforcement and skill-building tools and strategies to be used after the video introduction.

All other contributors on this topic reported using the traditional pattern of letter introduction with the home row keys taught in the first lesson or two, and other letters introduced usually at the rate of two per lesson, though the order of introducing them varied. Several people recommended specific texts or curriculum material. One contributor was quite adamant that the most-used letters be introduced first, and he shared information on the frequency of letter use in "typical correspondence" (VFG expert #9, emails, October 5, 1999 and October 9, 1999).

Several people described the pattern they use in teaching each new letter, emphasized the importance of practice on the common letter combinations and words, and stressed the crucial role of frequent review of previously introduced letters.

One contributor suggested that one consideration for selecting an instruction methodology is a teacher's preference. "Traditional introduction of keys is most well known and offers great confidence to the teacher. Other methods work. A key element in the learning process is teacher confidence" (VFG expert #2, email, October 6, 1999).

Recommended schedules for keyboarding instruction ranged widely among the six people who commented, from 20 minutes a day three times a week to 45 minutes every day. Five of these six respondents recommended frequent sessions, from three to five per week. The sixth reported she uses a 40 minute period once a week throughout the school year. Early in the school year the time is devoted entirely to keyboarding lessons; after students have learned all the keys, the time is split between skill-building drills and keying of spelling lessons.

Keyboarding Skill Assessment: Importance and Methods

Six group members made comments on this topic. These six had quite a range of different opinion and experiences. One teacher said she does not assess her students skill development at all; she says they are already "pretty competitive" and seem to have enough personal motivation to keep improving. She tries to "downplay the competition part and emphasize the improvement. Speed is not the goal. Comfort and ease with writing is. Keyboarding is a tool to help them with their writing" (VFG expert #5, email, October 12, 1999).

Another person agreed in part, but disagreed about the importance of emphasizing speed. " 'Grading' for keyboarding is unnecessary and inappropriate. Building speed is vital" (VFG expert #2, email, October 11, 1999). This person suggested using a pattern of repeated, 15-30 second speed drills, from which students can easily assess their own progress.

Another person suggested assessing only for technique (rather than for speed and/ or accuracy) during the first weeks of instruction. He recommended the use of technique assessment charts which are found in many keyboarding instruction materials, and which "allow for self-assessment, assessment by other students, and assessment by the teacher" (VFG expert #1, email, October 11, 1999). Another respondent to this topic said he finds that if timed writings are introduced before five or six weeks of instruction, students will "get frustrated with too much pressure and make too many errors" (VFG expert #7, email, October 11, 1999).

A different approach to assessment was provided by a teacher who gets her class to set their class goal, for instance: "completing 15 lessons at 10 wpm with 85% accuracy by June." She also encourages individual students to set personal goals. She includes progress reports with students' report cards, showing the lessons the student has completed with the speed and accuracy scores they've achieved (VFG expert #8, email, October 7, 1999).

Helping Hunt-and-Peck Typists Learn to Touch-Key

Four individuals contributed ideas on the topic of teaching keyboarding to students who have established hunt-and-peck habits prior to instruction. All respondents in some way emphasized that it is not instructional techniques that are needed to help this group. The challenge is a motivational one. Students must choose to change their habits, or any instructional techniques will be minimally effective. Once students choose to change, they must then accept some personal responsibility for the hard work the change will require.

Here's how one teacher explains all this to students:

> I like to begin with a little history of how the "qwerty" keyboard came to be. Then I like to compare other skills like "finger counting" instead of memorizing math facts, printing to cursive writing, riding a tricycle as opposed to a two wheeler. All of the lower skill levels achieve the result desired, all take effort to move to the next level, and the second level is easier and more efficient once mastered. (VFG expert #8, email, October 10, 1999)

Here's how another respondent advises teachers to help their students take responsibility for their own learning:

> Involve students in the process. Show them how to tape a piece of paper over the keys, and then place their fingers on the correct keys under the paper. Give them the responsibility for using this method until they believe they have mastered the touch method. Tell them that they are responsible for taping paper over the keys at any time in the future if they begin to look at the keys again. (VFG expert #2, email, October 11, 1999)

Another person suggested that the teacher should take an uncompromising attitude regarding technique, and not allow students to key if they persist in the hunt-and-peck method once touch-keying has been taught. He suggests that the teacher should simply turn off or remove the keyboard until the student agrees to use proper technique. He goes on to say that if students are reverting to hunt-and-peck habits, it may be because they feel under pressure to reach greater speed or accuracy levels. The teacher should place the greater emphasis on proper technique (VFG expert #8, email, October 11,

1999). Another teacher also recommended de-emphasizing accuracy with these students, until they establish correct fingering patterns:

> I give them "permission" to make as many mistakes as they need in order to memorize the location of a letter. I think that the process of making mistakes is necessary to ultimately learn letter location. Once the accuracy is learned the speed can be easily increased. (VFG expert #8, email, October 11, 1999)

Error Correction Procedures During Learning Stages

Six people responded to a question which asked whether learners who are keying for a project (as opposed to practicing keyboarding for its own sake) should be taught to correct errors immediately when they notice them, or hold all corrections until after keying in the work. Three of the six respondents to this topic recommend that students be instructed not to correct errors when noticed, either because it slows the keying process or because it breaks concentration. One person points out that doing the corrections as a follow up step after completing the keying should be encouraged in part because it provides an opportunity for the student to look for and make other improvements to the writing as well as simple keying error corrections (VFG expert #9, email, October 11, 1999).

Two other respondents recommended the opposite approach. They stated that students should be taught to correct errors immediately upon noticing them; that efficient error correction should be taught as a fundamental technique. One stated that immediately after making an error is the most efficient time to correct it (VFG expert #2, email, October 11, 1999). The other emphasized that accuracy no longer means keying without making errors; it now includes noticing and correcting the errors that are made (VFG expert #1, email, October 11, 1999).

This expert provided this context for her opinion:

> Historically in traditional classes using typewriters, students were taught to continue typing whenever an error was made and were penalized heavily for each error. This was due to the amount of time it took to correct an error (if indeed it was possible to correct). The limitations of traditional typewriters are no longer an issue with today's keyboarding equipment. (VFG expert #2, email, October 11, 1999)

The sixth respondent on this topic said, "As far as I'm concerned, WHEN they do it is not as important as THAT they DO it." (VFG expert #5, email, October 12, 1999)

Several respondents on both sides of this issue brought up the use of spell checkers as an error correction tool, and said they would advise students about when to correct errors based in part on whether or not a spell check feature was available to them.

Peer Monitoring of Technique

Three people spoke up on this topic, with three different opinions. One said that peer monitoring for keyboarding technique works quite well as one method of helping students develop their skills. She recommends that students pair up and one observes the other on a specific technique (such as eyes on copy, or fingers returning to home position) during a short timed drill. The observers then "describe what was good and what needed improvement" and then the two switch roles. "This is recommended because students learn how to identify specific areas of improvement, and they more readily adapt to using good techniques themselves" (VFG expert #2, email, October 11, 1999).

Another respondent said she does not recommend peer-monitoring, for two reasons: first, because it tends to interfere with the keyboarder's concentration which affects performance adversely; and second, because students are not always clear on proper technique and they may then advise their peers incorrectly (VFG expert #8, email, October 10, 1999).

The third respondent on this topic said peer-monitoring of technique and posture could be useful if done clandestinely from a distance so that the keyboarder was unaware of the other student's observation. Knowledge of being observed would make the

keyboarder too self-conscious and inhibit optimum performance which could be counterproductive to learning (VFG expert #9, email, October 11, 1999).

Classroom Management Routines and Tips for Using Portable Keyboards

Five people shared ideas about the systems they've used for labeling, transporting, and sharing portable keyboards, for blocking visual access to the letters on the keys, for keeping track of student files, for conducting keyboarding lessons, for motivating students, and for celebrating student achievements.

Results of the Content Analysis

Portable Keyboards and Touch-Keyboarding Curricula for the Classroom

The market in portable computing equipment is evolving rapidly, and findings from this research component will likely be obsolete by the time this work can be shared. For example, since this project was initiated in March 1999, there has been a major change in features offered by some of the portable keyboard manufacturers—an infrared uplink option is now available for many models which allows text to be transferred from the portable keyboard to a computer word processor (or directly to a printer) without the use of a physical cable connection. This significant advance in ease-of-use has changed the criteria for features that a school should consider when planning a purchase. Also, significant evolution in portable computer technology may make text-entry-only devices less of a bargain for school use soon, and other models may need to be included for the data to be most useful.

The tables which follow summarize the data from this analysis.

Model of Portable Keyboard	Cost each, based on purchase of 25	Years of warranty coverage	Cost/yr under warranty	Power source	Compatibility	Features beyond basic text entry capability
Laser PC-6	$290	3	$96.67	(4) AA batteries; Ni-MH rechargeable battery pack and AC adapter available at extra cost	PC/Mac (iMac interface is extra)	Case and AC adaptor are included in price; Dual screen modes (8 lines by 80 characters or 4 lines by 40 characters); cut/paste, some additional formatting options; stores up to 100 pages of text in up to 45 named files; spellcheck, typing tutor, calend
	Perfect Solutions Software, Inc. / 15950 Schweizer Court / West Palm Beach, FL 33414-7128 (800) 884-1184 • Fax: (561) 790-0108 • Email: perfect@gate.net • http://www.perfectsolutions.com/notebook.htm					
QuickPad IR	$189	3	$63.00	(4) AA batteries; Ni-MH rechargeable battery pack and AC adapter available at extra cost	PC/Mac (iMac interface is extra)	Spellcheck; stores up to 70 pages of text in up 250 named files in up to 10 folders; password protection for folders; non-English language support; calculator; price includes infrared send/receive capability and case. Accessories available (additional c
	QuickPAD Technology Corp. / 620B Clyde Ave. / Mountain View, CA 94043 (800) 373-8181 • Fax: (650) 964-2426 • Email: sales@quickpad.com • http://www.quickpad.com/index_m.htm					

Figure 3. Portable keyboards reviewed by the researcher for cost and feature comparisons, April 2000. (Continued from previous page.)

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Model of Portable Keyboard	Cost each, based on purchase of 25	Years of warranty coverage	Cost per year under warranty	Power source	Compatibility	Features beyond basic text entry capability
AlphaSmart 3000	$185	3	$61.67	(3) AA batteries; auto-off feature to preserve battery life; nicad battery pack and AC adapter available.	PC/Mac/USB	Spellcheck; typing timer; cut/copy/paste within and between files; auto save of 12 files totalling approximately 100 pages; keyword search; non-English language support; password protection; alternate keyboard layouts supported (Dvorak, single hand). A
AlphaSmart 3000 IR	$220	3	$73.33	(3) AA batteries (auto-off feature to preserve battery life); nicad battery pack and AC adapter available.	PC/Mac/USB	Same as 3000, but infrared file transfer is included.
	Intelligent Peripheral Devices, Inc. / 20380 Town Center Lane, Suite 270 / Cupertino, CA 95014 Sales: (888) 274-0680 • Fax: (408) 252-9409 • Email: info@alphasmart.com • http://www.alphasmart.com					
CalcuScribe "Uno"	$220	3	$73.33	(3) AA batteries; nicad battery pack and AC adapter available at extra cost.	PC/Mac, but cables are additional cost	10-key keypad and calulator functions incorporated in unit; lid/screen on hinge which folds down over the keyboard. Accessories available (additional cost): Infrared file transfer capability; case.
CalcuScribe "Duo"	$260	3	$86.67	(3)AA batteries; nicad batteries and AC adapter available at extra cost.	PC/Mac, but cables are additional cost	Same as Uno but offers an additional screen mode; 8 lines of 80 characters as well as the 4 lines of 40 characters that the Uno model supports.
	CalcuScribe / 98 Cervantes Blvd., Suite #1 / San Francisco, CA 94123 (415) 923-1024 • Fax: 415-923-1025 • Email: info@calcuscribe.com • http://www.calcuscribe.com					
DreamWriter T100	$209	3	$69.67	Rechargeable battery system provides 8 hours power, requires 4 hours to recharge; Nicad battery pack and AC adapter available	PC/Mac	Spellcheck; some text formatting; installed typing tutor software; cut/copy/paste; search and replace; non-English language support; calculator; clock; math drill software installed; stores approximately 40 pages in up to 128 named files. Accessories a
DreamWriter T400/IR	$245	3	$81.67	Rechargeable battery system provides 8 hours power, requires 4 hours to recharge; Nicad battery pack and AC adapter available	PC/Mac	Spellcheck; some text formatting; installed typing tutor software; cut/copy/paste; search and replace; non-English language support; calculator; clock; math drill software installed; stores approximately 100 pages in up to 128 named files; password pro
	NTS Computer Systems Ltd. / 11491 Kingston Street / Maple Ridge, British Columbia / Canada V2X OY6 (800) 663-7163 • Fax: (604) 465-3323 • Email: info@dreamwriter.com • http://www.dreamwriter.com/					

Figure 3. Portable keyboards reviewed by the researcher for cost and feature comparisons in April 2000. Contined on next page.

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Teacher-directed elementary keyboarding curricula	Cost, when purchased for a class of 25	All letter and punctuation keys are taught quickly	Technique & posture well presented	Technique is emphasized over speed and accuracy	Motivators are intrinsic	Text and graphics suitable for the age group	Ergonomic and health concerns are well presented	Brief, frequent lessons	TOTAL POINTS
Diana King Method: Keyboarding Skills	$203	2	1	2	2	2	0	2	11
Comments:	Posture and technique illustrations are not included, but would greatly help the inexperienced trainer and learners. Encourages vocalization as an aid to learning. Teaches 2 spaces after terminal punctuation (inappropriate for word processor keyboarding).								
More information:	*Educators Publishing Service, Inc.* / 31 Smith Place / Cambridge, MA 02138-1089 (800) 225-5750; Fax: (617) 547-0412 • http://www.epsbooks.com								
Herzog System (Elementary Fast-Track)	$325	2	2	1	2	1	2	2	12
Comments:	Price includes tactile "hub key sensors" for 25 stations, teacher pack, and a license to make 25 copies of the student book. Use of all CAPS in initial lessons is puzzling. Design of book and use of term "On Line" should be updated for modern students. Continues to teach 2 spaces after terminal punctuation and 5 spaces for indent (holdovers from typewriter keyboarding, inappropriate for word processors).								
More information:	*HERZOG Keyboarding* / 1433 E. Broadway / Tucson, AZ 85719 / Phone: (520) 792-2550; Fax:(520) 792-2551								
Keyboard Success	$247	0	2	2	2	2	0	2	10
Comments:	Emphasizes individual goals based on handwriting speed. Many good features, but takes 29 lessons to introduce all keys.								
More information:	*International Society for Technology in Education* / 480 Charnelton St. / Eugene, OR 97401-2626 (800) 336-5191; Fax: (541) 302-3778 • Email: cust_svc@iste.org • http://www.iste.org								
Touch Typing in Ten Hours!	$195	0	2	0	2	2	2	2	10
Comments:	Encourages vocalization as an aid to learning. Cost is for a school site license; permits unlimited copying of both teacher and student manual.								
More information:	*Touch Typing in Ten Hours!* by Dolores Lisman / 2520 Toledo St. / Bellingham, WA 98226 / (360) 671-4326								
Typin's Cool	$715	2	1	2	2	2	0	2	11
Comments:	Provides a video to introduce all letter and punctuation keys by finger columns and uses a mnemonic story to aid recall. Materials include the instructional video, a teacher-training video, teaching guide and assessment materials, a software component, and 25 student books. Cost is for a school site license; schools are permitted (and encouraged) to recoup the program's cost by reselling copies of the software and books. Teaches 2 spaces after terminal punctuation (inappropriate for word processor keyboarding).								
More information:	*Typin's Cool* / 251 Laurier Avenue West, Suite 203 / Ottawa, Ontario CANADA K1P 5J6 (800) 267-2587 Email: mail@typins-cool.com • http://typins-cool.com								

Figure 4. Keyboarding curriculum materials reviewed and compared by the researcher in April 2000. Points were assigned in each category according to this scale: Poor = 0; acceptable = 1; excellent = 2.

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Results from the Pilot Case Study

The literature review, teacher survey, and focus group discussion provided a wealth of information which the researcher drew from in creating a resource package to support classroom touch-keyboarding instruction. Once this prototype package was assembled, it was submitted to a pilot test in a public school classroom.

The first of the two scheduled interviews with this teacher was conducted on February 18, 2000. By this date the subject had initiated the program with her class of 28 sixth grade students, had completed the phase one (conceptual introduction) portion of the program, and had just begun phase two (the fingering boot camp). The first 28 minutes of the interview were recorded for researcher reference and study verification purposes. The recording was then discontinued because a group of primary students in an after-school program came into the room at that point, and it became too noisy for recording. The researcher made written notes throughout the interview, and following is a summary of the subject's responses based on those written notes. The teacher added relevant comments beyond the material covered by the planned questions, and those are also included in this summary.

The subject had spent one hour reviewing the materials prior to initiating the instruction. She felt that this amount of preparation time had been adequate. She commented that the materials were clear, and that one hour had seemed sufficient. She further commented that curriculum materials she uses in some other subject areas require more time to assimilate than these materials required. It should be noted here that though this teacher had never taught keyboarding previously, she does touch-type herself.

The subject had not noticed errors in the materials, though she did ask for clarification of how to use the scoring guide for the handwriting speed assessment. No information on how to use this guide was included in the package, so this was noted as an omission to be corrected.

Regarding the organization of the materials, the subject reported being able to find

specific items when needed. She also demonstrated this; when asked to refer to the scoring guide for the handwriting speed assessment she found it easily, and also quickly located the mnemonic poem when asked to do so.

Did the teacher feel confident about initiating the instruction? On a scale of zero to five the subject described feeling "about three and a half" after reading through the materials. (A rating of five was defined as enthusiastic and unhesitating; zero was defined as having so little confidence that instruction was not initiated.)

The teacher described her students as having no touch-keyboarding ability before the program was started. Since students had been using the portable keyboards for occasional writing tasks before this program began, some of the students had become fairly adept at two finger hunt-and-peck typing; none had made significant progress learning to touch-key, even though some had used a software tutorial program during weekly visits to the school computer lab.

The subject was asked if she had made use of each of these specific resources from the prototype package, and her responses are indicated:

- Weekly planner section? Yes.
- Parent letter? Yes.
- Wall chart? Yes.
- Fingering poem? Yes. The teacher commented that some of the 6th grade students thought the poem to be rather childish but that she believed that it was a good tool for learning and she intended to have them all memorize it "whether they thought it silly or not." She said they'd tried to "rap it up a bit" (the poem) to make it more fun to learn.

Is the teacher able to demonstrate proper keyboarding technique to students? (e.g., curved fingers resting lightly in home base position; correct body, arm, and leg posture; correct finger reaches; correct shift key technique; a quick chicken-peck keystroke action.) Yes, the teacher spontaneously demonstrated keyboarding as she talked about the

instruction, and she did demonstrate proper technique in all respects. Here again it should be noted that this teacher was a competent touch-typist before beginning this program.

The teacher mentioned making use of the blank keyboards to allow students to practice fingering at times beyond those when they had the keyboards available at their desks. This was an unintended use for the blank keyboard master. It had been provided for use in assessing students' ability to recall key locations after the second phase of the program. No information regarding the use of that blank keyboard master had been provided in the package however. This is an omission which should be corrected in future.

The second interview was conducted on April 1st, 2000. This was later than had been intended because of schedule conflicts which had intervened, but the delay was perhaps fortuitous. By the time of the second interview, students had been integrating their keyboard skills into their writing tasks for a full month. According to the total hours of keyboarding time which the teacher had noted on the weekly planner pages, students had accumulated 12 hours of keyboarding beyond the "boot camp" week. They were now routinely using the portable keyboards to complete their required daily language lessons.

At the point when they had accumulated ten hours of keyboard time the class had done a timed writing to determine their keyboarding speed rates. Several of the students had reached 25 to 30 words per minute, but the teacher estimated that the average speed was around 12 words per minute at ten hours. Some students had thought they were keying faster than the speed at which they tested and mentioned feeling disappointed.

The teacher reported that, on the whole, students' motivation to improve their skills remained high. She also reported little need to correct technique problems at this point; students had become habituated to proper posture and keystroking. She mentioned that some students continue to watch their fingers and must still be reminded not to do that. She also mentioned her observation that students' use of vocalization as they keyed seemed to disappear about the same time she realized she did not need to monitor and

correct technique constantly any longer.

One new student had joined the class after the boot camp training week had concluded. The teacher assigned a willing classmate to guide the new student through the boot camp lessons so that he could begin to key his language lessons also. This seemed to be working fairly well; the new student was strongly motivated by observing his classmates' keying skills, and was making good progress at the time of this interview.

The teacher reported that she will definitely use this program again. She feels it is proving successful with her students, and she believes the integral model is the only possible way she can incorporate touch-keyboarding instruction in her classroom/school situation. Several times during the interviews she mentioned that finding the time in the school day is the biggest problem she faces.

Other teachers in her school are intrigued, and have been following her class's progress with interest. She has asked for (and received) permission to share the materials with them.

CHAPTER 5

DISCUSSION

How Research Results Determined the Product Form and Content

The objective for this project was to produce a package of resources to support the teaching of touch-keyboarding by upper elementary classroom teachers who have portable keyboards for student use in their classrooms. The declared intent was that this curriculum package be teacher-friendly, meaning that it should be presented in a format which teachers would likely be comfortable using. This chapter will describe how the prototype resource package, *First Things First: A Teacher's Guide for Integrating Touch-Keyboard Training in the Elementary Classroom* (see Appendix D) was shaped in response to the research findings. Hereafter, the product name will be abbreviated to FTF.

The first research question sought to ascertain what elements teachers would expect a keyboarding instruction curriculum package to include. A written survey was conducted of a sample of teachers to answer this question. The results, presented in Chapter 4 and graphically illustrated in Figure 1, revealed that these are the five resources most expected by the teachers surveyed (in order of priority):

1. Day by day lesson plans for a six week skill introduction unit.
2. A set of 10 minute video lessons (on VHS tape, CD ROM or Digital Video Disc) to be used in sequence every day for six weeks.
3. Black line masters of skill drills for transparencies and handouts.
4. A one day inservice class, covering both the operation and management of the keyboards in the classroom environment, and touch-keyboarding instruction methods.
5. Tips, curriculum integration lesson plans and unit management advice from other teachers who have successfully implemented keyboarding instruction in the elementary classroom using portable keyboards.

Three of these resource types (items 1, 3 and 5 above) were developed and included in the FTF curriculum package. The video component and inservice training could not be implemented within the time frame and budget of this project, though they define areas for further development of the product.

Several of the write-in suggestions for resources dealt with learning goals and evaluation of student learning progress. These areas are addressed in the prototype package and resources are included.

This first section of the teacher survey also identified resources which these teachers said they would not use even if they had them. This data caused the researcher to significantly revise preliminary plans for the resource package, which had included internet components such as a website and an email discussion/support group. At this time such resources would evidently not be valued or exploited by the intended users of these materials. The researcher nevertheless initiated development of a website and launched an email discussion group in support of the project objectives; these are referenced in FTF in the Additional Resources section. They may prove more valuable to teachers after they begin implementing keyboarding instruction than they did at the time of the survey. The website format allows for updating of material as needed and it is hoped that the email discussion group will not only provide some support for teachers implementing touch-keyboarding instruction in their classrooms, but will also provide a feedback loop to the researcher for further development of the product.

The second research question asked how a keyboarding instruction resource package should be formatted and organized so as to be most useful to teachers. The survey data in response to that question (Table 1) indicated that print material in binder format was preferred by a wide margin over the other media choices suggested. The binder format then, organized with tabbed dividers corresponding to the resources which the surveyed teachers had identified as most important to them, was fixed upon for the

physical structure of FTF.

The third research question addressed by the teacher survey was intended to identify areas where teachers either lack pertinent knowledge, or hold misconceptions related to keyboarding skill and instruction. The data gleaned from this part of the survey was not definitive but is thought-provoking, and suggests areas in which further research inquiry could guide teachers. Since the data resulting from the survey section about resources had indicated that a large percentage of the surveyed teachers would not use "background information" even if it was provided (see Figure 1), the researcher minimized and condensed the informational and reference material to be included within FTF. Deciding what information must be included and what information teachers would perhaps only find burdensome was a difficult process. The degree of indispensability of particular information was decided based in part on the literature review, and in part on the data gathered from the virtual focus group discussion. The introduction section of the prototype product now provides only enough keyboarding instruction background information to prepare a teacher to plan, schedule, and implement instruction sessions. Some pertinent facts, informed opinions, and research findings were included subtly in the form of side-bars and quotes which were sprinkled throughout the materials. These were intended both to affirm and inform teachers' instructional efforts, while being easy to assimilate piecemeal. The researcher recognizes that the reason teachers said they would not use background information was not probed.

The fourth research question was addressed both with the literature review and in the focus group discussion; it aimed to determine the essential components of a successful elementary level touch-keyboarding instructional program, specifically as conducted in the classroom environment, by the classroom teacher, using portable keyboards. The data gathered was used in two ways: it helped determine the content of the FTF instructional material, and it helped determine the necessary elements of

background information teachers must have to be successful in teaching touch-keyboarding.

Relevant learnings from the focus group discussion which were incorporated into FTF are:

1. Teachers who do not personally touch-key can successfully teach the skill to their elementary grade students. Some preparation is crucial. Teachers must understand and be able to articulate to their students the importance of developing proper techniques. They must understand how psychomotor skills are developed in order to create and maintain an appropriate learning environment for students.

2. Integration of touch-keyboarding skill development with other subjects is the key to finding sufficient time for skill development in the elementary classroom program.

3. Instruction in touch-keyboarding should make it clear to learners that proper posture and keystroking technique are important both for skill development, and for prevention of physical health problems such as carpal tunnel syndrome.

4. Student learning assessment at the elementary level should focus on technique, rather than speed or accuracy. Assigning grades for keyboarding progress is inappropriate at the elementary level.

5. Students who have already established hunt-and-peck habits have difficulty learning to touch-key. One way to help these students is to reduce any pressure to achieve speed or accuracy levels until technique fundamentals are firmly instilled.

6. Error correction techniques should be taught, but de-emphasized during practice times. When students are keying work which will be reviewed for content (rather than practicing keyboarding for its own sake) they should be expected to correct errors.

The final research question concerned the effectiveness of the product when implemented in a pilot case study. This occasioned a reflective look back over the entire

research project, with a view towards product improvement.

The purpose of the case study was to identify areas of strength and weakness in the prototype product in order to guide further development and testing. The case study did not attempt to assess the success of the program in terms of student learning outcomes. It addressed only the teacher's implementation of the program. Student learning results are indeed the underlying purpose; however assessment of that value is beyond the scope of this current project. "First things first" is the pertinent maxim here; teachers must begin to implement touch-keyboarding instruction before student learning can be meaningfully evaluated. As with all educational innovations, it takes time to gain comfort and familiarity with new tools, methods, and instructional objectives, and the researcher recognizes that facilitating widespread teacher implementation of touch-keyboarding instruction is only a first step down the road toward widespread student skill mastery.

The suggestions which follow are derived from the results of the case study, from comments made by the researcher's sponsoring university project committee, and from the information gained from the other research components regarding potential package elements which could not be implemented in the prototype package due to financial and time constraints.

Suggestions for Further Development of the Product

The teacher survey data indicated that many teachers would value having lessons provided in video format which they could play for students. Video lessons could also be helpful for independent review by individual students, and would provide an option for helping students catch up who miss a lesson.

However, video lessons could also be misused, and prove to be no more helpful for most students than reliance on software tutorials. Because it is of crucial importance

that a knowledgeable teacher monitor and guide student technique development (see Chapter 1), there is risk of sabotaging the program by providing entire lessons in video format. Some teachers might use such lessons to replace their own personal involvement in the instruction, in the same way some teachers currently use keyboarding tutorial software.

One possible solution would be to provide video clips which support the lessons with visual demonstrations of keystroking technique and posture problems, but in a nonlinear format. Nonlinear video clips could be accessed in any order, as needed, to support, rather than supplant, the lessons. This would be an excellent medium for showing students examples of people using keyboarding skills in many kinds of circumstances. Video would also permit an effective way to illustrate ergonomic concepts, and could include demonstrations of preventive exercises. These applications are quite different than providing complete lessons in a linear video format such as the VHS cassette. Evidence from the data gathered in the teacher survey may indicate that teachers would not value, or might not be able to utilize, nonlinear video material however. On the question which was asked of teachers about their preferred format for the keyboarding instruction materials (Table 1), most indicated a preference for the print material in a binder, over the option "a CD ROM with printable files, which also includes the audio or video lesson segments you can display on a large-screen attached to your classroom computer." Since this question did not request a response as to whether or not the teacher has access to the requisite equipment for utilizing a nonlinear video format, there is no way to determine from this data whether teachers would have chosen it if it were truly an option they could make use of. The equipment required for presenting nonlinear video (such as a CD ROM or DVD player and a large-screen display) is less commonly found in the typical classroom than are VCRs.

Some models of portable keyboards are now being produced with keyboarding drill software installed, or available as an option. It might be useful to provide lesson plans and guidance for teachers that will enable their students to gain advantage from such software while still maintaining an emphasis on technique over speed or accuracy.

Participants in the virtual focus group discussion were in agreement that the most important preparation needed by the teacher new to keyboarding instruction is knowledge of proper touch-keyboarding technique and ability to articulate its importance. The surveyed teachers indicated they would like inservice training. A logical conclusion can be drawn that an inservice program to train teachers in keyboarding instruction methodology would be a valuable adjunct to this resource package.

A Walden University faculty reader recommended that teachers and parents be provided with more information regarding physical health issues related to keyboarding. Improper keystroking techniques and poor posture are known causes of repetitive stress injuries such as carpal tunnel syndrome (Hering and Held, 1998; National Institute for Occupational Safety and Health, 1997; Ober, 1993, p. 37) and this fact should be discussed with children as they learn to key. Frequent rest periods and special exercises can help prevent health problems, and the package should include exercise descriptions and resources for further information. This information should also be included in the letter to parents, so that they can spot and correct bad habits they may observe when their children key at home.

Other suggestions made by the case study subject and readers:

- Print instructions for using the blank keyboard master right on it.
- Provide explicit instructions for how to use the word count guide.
- Include masters for an invitation to parents to attend a program completion ceremony and for a certificate to be awarded to students.

- Include more tips for streamlining the process of uploading keyed material from the keyboards to computers or printers.
- Put the mnemonic poem to a catchy rhythm or melody.
- Suggest methods for instructing and assisting students who miss instructional periods (such as the peer-tutoring used in the case study for a student who joined the class after the boot camp).

Recommendations for Further Research

This study did not examine student learning achievement resulting from the use of the product, and that is the most obvious area for further research. Much more study should be done with a variety of teachers and classroom situations. The program has not yet been tested by a teacher who does not personally touch-key; that is another important area for further study.

These research questions are a few which could be asked in subsequent research projects:

1. Do students accomplish touch-keyboard mastery as a result of instruction using this program?

2. Will classroom teachers with no prior ability to touch-key be effective at training their students using this program?

4. Would the program be more effective with a video component?

5. Would the program be more effective with a teacher preparation inservice component?

Controversial Aspects of the Product

There are features of the FTF product that are not fully supported by data gathered during the project research. Some data was contradictory, and the researcher

allowed personal experience to influence product development where research data and published literature were not clearly definitive. Further objective research is needed in these areas.

As noted in Chapter 2, in the section *Characteristics of Effective Keyboarding Instruction in Elementary Grades*, much research supports a rapid introduction of fingering patterns; yet the most common interpretation of *rapid* in this context is a pattern of introducing two to three characters per lesson. At this rate it takes 11 to 16 lessons for students to be introduced to all 26 letters and the common punctuation marks. Some less common keyboarding instruction programs introduce keys more rapidly, sometimes using mnemonic tools to help students learn and recall fingering patterns (Herzog, 1990; King, 1986; Typin's Cool, 1999). In these methods, only four to six lessons are required for learning the fingering of the 26 letters and the major punctuation marks. Only one of the focus group participants had personal experience with any of these methods however, so the data from that portion of the research cannot be said to support such an instructional approach; nevertheless the researcher did design a five lesson boot camp approach to character introduction for the FTF package for these reasons:

1. A more rapid introduction of fingering techniques enables learners to use those correct techniques for all their keying much sooner in the learning process. This is increasingly important for students today, many of whom have liberal access to keyboards outside the lesson environment. Continual reversion to the hunt and peck manner of keying when they need characters which have not yet been introduced in lessons will impede development of the crucial reliance on kinesthetic cues.

2. The sooner students can properly key all characters, the sooner they can make productive use of the skill in other school subject areas. There is no evidence that a hastened introductory period harms the learning process if it is followed by monitored practice until automaticity is finally gained. "Early attention to real-life tasks results in

vastly superior proficiency at such tasks, at no cost whatever to stroking skills.... Excessive focus on stroking skills and sketchy, delayed treatment of realistic tasks in introductory keyboard courses are very wrong" (West, 1986, p. 80-81). However, it must be noted that West clarified his use of the word *early* in that passage to mean after 5 to 9 weeks of instruction, and after students are able to key at a speed of over 20 words per minute. The FTF instructional design moves students to "real-life tasks" much sooner; after just 3 hours of instruction. Most students will not be keying faster than 5 to 10 words per minute at this early stage.

3. The time and scheduling constraints common in many elementary school programs allow teachers little flexibility for accommodating a prolonged series of dedicated keyboarding lessons. The FTF model postulates that many of the hours of practice required to develop automaticity can be accomplished through application of the skill on any student writing task once the fundamental techniques have been established. This model is proposed as a way of insuring that students actually do receive sufficient keyboard practice time to attain automaticity. The FTF package includes a minimum of character practice drill material; instead the program provides tools to help teachers integrate keyboard use in student writing tasks arising from other subject areas that are already accommodated in the crowded elementary program, such as spelling and language arts lessons.

In conducting a comparison study to learn whether a software tutorial approach or teacher-directed lesson plan approach would prove most effective with third through sixth grade students, Lois Mayer Nichols compared the highly regarded software tutorial (*Type to Learn*) with the Diana King method (in which the teacher conducts the instruction, and students use any typewriter or word processing program). A test conducted at the end of the lessons showed a slightly higher speed for the software group (average 8.8 words per minute versus 7.2), though the software group made more errors (2.7 versus 1.5). The

most significant difference between the two programs however, was in the school time it took to complete the lessons.

> Although Type to Learn students typed slightly faster, it took 21 weeks to complete the lessons and their accuracy was not as high as that of the Diana King students, whose lessons only took 12 weeks to complete. Based on the results of this study, it seems reasonable to recommend the Diana King approach to keyboarding instruction as an efficient and effective method. (Nichols, 1995, p. 24)

The FTF model is centered around the Diana King method, as described in her book, *Keyboarding Skills: All Grades* (1986). FTF adds a component of three preparatory lessons prior to the fingering instruction period, and then presents the core of the King method in a five lesson "fingering boot camp" sequence. The FTF program then departs from the King method by moving students to keyboarding practice arising from writing tasks in other school subject areas, rather than practice on the common words and phrases in King's material. Therefore, the FTF program will require even less dedicated lesson time than Nichols study did, and it is hoped that the accomplishment of purposeful work using their new keyboarding skills may bolster student pride and motivation, which could lend importance to the purpose for the learning.

Another feature of the FTF program which may be controversial is that it introduces the letters in alphabetical order (as do the King and Herzog methods). Some researchers claim that the order of letter introduction is important, though there is no consensus on whether that order should be based on letter frequency in language, keyboard layout patterns (rows/columns), finger dominance, alphabetic order, or according to a "skip around" pattern; all have their proponents. Others state that the letter introduction order is unimportant to the learning process; that:

> "What is important ... is that the keyboard be introduced in such a way as to provide an opportunity for students to key sentences as early as possible. Keying sentences permits transfer of learning to later sequences, develops chains more quickly, and provides better motivation. (McLean, 1995, p. 28)

The researcher could find no unequivocal evidence of the relative effectiveness of various letter introduction patterns with elementary age learners. The alphabetic order for letter introduction was adopted for FTF because that pattern is already quite familiar to both elementary students and teachers. A stated objective for this product is that it be "teacher-friendly". One of the focus group experts did emphasize that teacher confidence is a "key element" in a successful instructional program (VFG expert #2, email, October 6, 1999). The comfortable, familiar alphabetic order may be a factor which will boost teacher confidence; and because it is already well known, it provides an established mnemonic base for the cognitive phase of learning the fingering patterns.

These instructional design features should be studied carefully in controlled research settings to determine their value as components of a touch-keyboarding instructional model to serve the learner circumstances and needs of these changing times. The researcher was emboldened to include the controversial elements in part by these comments made by a keyboarding teacher referring to the curriculum changes required during the 1980s shift in writing tools from typewriters to computers:

> The teacher must weigh each change in teaching techniques carefully. Keep the best of the old but certainly don't be afraid to try new methods. It will be years before a formula for success is tested, proved, and published. Each teacher becomes a researcher. (Frankeberger, 1990, p. 24)

In the interests of students who will not remember a time before personal computers as writing tools, this project presents a model for keyboarding instruction as a basic literacy skill; a foundation skill to be solidly established in the elementary school classroom, upon which mastery of the computer as a tool for the mind may be built.

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Appendix A: Teacher Survey Documents

M.S. Project form 3

Approved by AAAA 6/25/99 DWH

Walden University

M.S. in Educational Change and Technology Innovation

PERMISSION REQUEST FOR RESEARCH INVOLVING HUMAN SUBJECTS

1. Project Title: (Use same title as Final Proposal)
Keys at Their Fingertips: A Study Supporting Development of a Resource Package For the Teaching of Keyboarding Skills in Upper Elementary Classrooms Using Portable Keyboards

2. Exemption category claimed: 2 (Insert the category number from previous pages.)

3. Principal Investigator: Gay (first) B. (mi) Wiseman (last) M.S. candidate (degree)

Address: 898 Green Valley Rd./P.O. Box 255/Dutch Flat, Ca 95714
(street) (city) (state) (zip)

Home Phone: 530/389 2872 Work Phone: 530/389 2872

4. Inclusive dates of project: 6/99 through 12/99

5. Check one: _____ Faculty Research X Student Research

Note: The following questions must be addressed completely. A request involving survey or interviews must be accompanied by copies of the instruments which will be used to gather data. Research applications must include a consent statement or consent form appropriate to the research questions. (Use the sample form as a guide in preparing forms, letters and oral statements.) Research involving the use of pathological specimens and existing data without identifiers does not require consent from subjects.

7. Abstract/Lay Summary

Describe the research, including research questions, the purpose of the research, and methods to be used (hypothesis and methodology). Describe the task(s) subjects will be asked to complete. **Use lay language (language understood by a person unfamiliar with the area of research). Area-specific jargon should be avoided or explicitly explained.** If using existing data, records or pathological specimens, explain the sources of data, the type of tissue used, and the means of access to data. (Provide attachments as necessary.)

8. Subject Population:

a. Number: Male: _____ Female: _____ Total: 288 (estimate. Gender irrelevant)

b. Age Range: 24 to 75 approximate

c. Location of Subjects: (elementary/secondary schools, universities, public or private institutions, other)
public elementary schools

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Permission Request for Research Involving Human Subjects

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d. Special Characteristics of Subjects: (mentally/physically challenged, gifted and talented, at risk, other)

none

e. If research is conducted through community agencies, written documentation of approval/cooperation from such agency (school, etc.) should accompany this application.

f. Describe how subjects will be identified or recruited. Attach recruitment information, i.e., advertisements, bulletin board notices, recruitment letters, etc.

Teachers in public schools east of Roseville in Placer Co. California will be requested to participate through the school principals. The principals will receive information about the project by mail.

g. If subjects are chosen from records, indicate who gave approval for use of the records. If private medical or student records, provide the protocol for securing consent of the subjects of the records and approval from the custodian of the records.

n/a

h. Who will make the initial contact with subjects? Describe how contact is made.

Principal researcher, Jay Wiseman, will make initial contact with a phone call to the school office to verify the principal's name, and ascertain the number of teachers at the target grade levels.

i. Will subjects receive inducements before, or rewards after the study? (Note: Include this information in your consent documents.)

Schools who participate will receive a copy of the keyboarding curriculum package produced as a result of the study.

j. If subjects are school children and class time is used to collect data, describe in detail the activity planned for non-participants. Who will supervise those children? (Note: Include this information in your consent documents.)

n/a

9. Confidentiality of Data

a. Describe provisions made to maintain confidentiality of data. Who will have access to data? Will data be made available to anyone other than the principal investigator? (School officials, medical personnel?) If yes, explain below and in the consent form.

Survey instruments will be returned anonymously by participants. There is no identifying information asked for or marked on the materials. The researcher's faculty adviser and project team may have access to the materials.

b. Where will data be stored and for how long? If tape recordings or videotapes are created, explain who will have access and how long the tapes will be retained. Written consent is required for recordings; the consent form should include this information as well.

The completed survey instruments will be destroyed one year after the completion of the project. Until then they will be stored in the private home office of the principal investigator.

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Permission Request for Research Involving Human Subjects

(p. 3)

10. Informed Consent Process

Simply giving a consent form to a subject does not constitute informed consent. Using the sample attached, prepare and attach a consent form, statement, or letter for review (for exemption categories 1, 2, 3, 5, 6).

Note: Researchers are cautioned that consent forms should be written in simple declarative sentences. The forms should be jargon-free. Foreign language versions should be prepared for any applicable research.

a. Consent form: Signature of subject and/or parent is required for research involving risk, and for research where a permanent record of results are retained (including videotapes).
b. Consent Statements/letters to subjects: Statements read to study subjects or distributed to participants prior to interview or as a cover sheet for a written survey should be modeled after the sample consent form, but do not require signature.
c. No active consent is required for observations of public behavior. Photos, films, videotaping, etc., require review by the Program Director and written consent of subjects. No active consent is required for review of public records, private records already stripped of identifiers, or research involving pathological specimens which are not identifiable by name or number.

11. Exempt Category #5: Public Service Programs

In addition to the information provided under *abstract*, above, provide documentation of conformity to the requirements for category #5, including written documentation or cooperations from the public agency involved in the research.

12. Exempt Category #6: Taste Testing

To be eligible for this category of research, all food tested must be GRAS (Generally Recognized As Safe) and wholesome. Food ingredients must be at or below the levels found to be safe by federal regulatory agencies. Describe the food to be tested and provide assurance that these conditions are met.

Applications for approval to use human subjects in research require the following assurances and signatures:

(Note: original inked signatures are required; no stamps or "per" signatures accepted.)

The signatures below certify that:

a. The information provided in this application form is correct.
b. The Principal Investigator will seek and obtain prior written approval from the Program Director in the event of any substantive modification in the proposal, including, but not limited to changes in cooperating investigators and agencies, as well as changes in procedures.
c. Unexpected or otherwise significant adverse events in the course of this study will be promptly reported.
d. Any significant new findings which develop during the course of this study which may affect the risks and benefits to participation will be reported in writing to the Program Director and to the subjects.
e. The research may not and will not be initiated until final written approval is granted.

This research, once approved, is subject to continuing review and approval by the Program Director. The Principal Investigator will maintain complete and accurate records of this research.

If these conditions are not met, approval of this research could be suspended.

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Permission Request for Research Involving Human Subjects

(p. 4)

Signature of Principal Investigator: Gary Wiseman Date: 6/3/99

As Program Director, I assume responsibility for ensuring that the student complies with University and federal regulations regarding the use for Human Subjects in research. I acknowledge that this research is in keeping with the standards set by the University and assure that the Principal Investigator has met all the requirements for review and approval of this research.

Signature of Program Director: Robert Kepperstan Date: 6-21-99

Gwen Hillesheim, Ed.D. Acting Director

approved: Dale R Stark 6/25/99
Assoc V.P Acad- Affairs

Submit to:
Gwen Hillesheim, M.S. Program Director, Walden University, 155 Fifth Ave. S., Minneapolis, MN 55401

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Research Methods Approval

Research Methods Approval

Instructions: Please complete this form in order to secure approval for collecting research data or information from sources. Included are experiments involving human subjects, surveys, structured interviews, and other methods of gathering research information from sources other than published materials. This approval process documents the human subject review function. Attach this form to the research proposal, the data collection instruments, correspondence with the sources, and release forms. Please use the back of this form if additional space is required to complete the following items. Return the completed form to your Program Director.

Student: Gay Wiseman Program: M.S in EDTI

Address: P.O. Box 255 / Dutch Flat, Ca 95714

Phone Numbers: (h) 530/389 2872 (w) 530/389 2872 Alpha #

Title of Research: Keys At Their Fingertips

Purpose of Research (reseach questions or objectives):

See reverse

Population and Sample: The population being studied is that of 4th, 5th, and 6th grade teachers in public schools of Placer County, California. The sample to be used is the set of those teachers currently employed at schools whose principals agree to participate.

How are the sources or subjects chosen? What consent and confidentiality information is to be given to the sources or subjects? All public schools in Placer County California east of Roseville will be requested to participate. School principals will use a reply postcard to indicate consent. Teachers will indicate consent by participation. +

How will the results be used? Research Paper X Publication ____ Product development X

Researcher's signature and date: Gay Wiseman 6/4/99

Advisor/Instructor's Signature and date: 6-.6-99

Decision: ✓ Approved ____ Not approved Date: 6·21·99

Remarks:

Program Director Signature and date: Robert Kefgenstan 6·21·99

+Survey instruments contain no individual identification information.

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Research Methods Approval

Purpose of Research (attachment)

Purpose of Research

Objectives

This research project will result in a package of information, teaching tools, and instructional resources for supporting classroom keyboard skill instruction in the upper elementary grades. The materials will be specifically designed around the use of portable keyboards which have different capabilities and limitations for keyboard training than typewriters or computer systems that have been used for this kind of training in the past.

Research Questions

In order to meet the project objectives, these research questions will be explored through a survey of a population of teachers:

1. What curricular components will upper elementary teachers expect to find in an instructional materials package for teaching keyboarding?

2. How should this package be organized and structured so as to be most useful and accessible to teachers?

3. What do upper elementary teachers already know or believe about teaching keyboarding to students at their grade level?

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Cover Letter to School Principals

<Date>

«Principal_title» «Principal_first» «Principal_last», Principal
«School»
«Mailing_Address»
«City», «State» «Zip»

Hello «Principal_title» «Principal_last»,

I am preparing a package of curriculum materials for teaching computer keyboarding skills in the classroom environment using low cost, portable keyboards. Your school can receive a copy of these teaching materials **at no charge**, in exchange for your participation in a brief survey to help guide development. I need details about teachers' needs and preferences regarding the content and organization of the package in order to assure its usefulness.

Your teachers' time is valuable and limited, so I have designed this survey to be completed in *less than 10 minutes*. Please distribute them to your **4th, 5th and 6th** grade teachers and ask them to complete and mail them by September 1st. Postpaid, pre-addressed envelopes are included. I have called ahead to find out how many surveys to send, but if I have made an error in the number of survey instruments needed, photocopies may be made.

Please use the enclosed postcard to let me know that you have distributed the surveys; this will also reserve your school's copy of the curriculum package, which will be sent to participating schools in December 1999.

Thank you very much for your support! Please do contact me if you have questions or ideas related to this project.

Sincerely,

Gay Wiseman
gwiseman@waldenu.edu

Computer Instructor at Ophir Elementary

P.O. Box 255

Dutch Flat, CA 95714
(530) 389-2872

Candidate for the M.S. degree

"Educational Change and Technology Innovation"
Walden University ~ **http://www.waldenu.edu**

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Survey Participation Agreement, Reply Postcard

Hello Gay,

We will participate in your survey related to the teaching of keyboarding skills in the upper elementary classroom. Copies of the instrument have been distributed to all the **4th, 5th and 6th** grade teachers at our school. They have been asked to mail them to you using the included postpaid envelopes **by September 1st.**

We understand that we will receive a copy of the teaching materials produced as a result of your research project, and that we can expect it in December 1999.

Name of school:

Cover Note Attached to Survey Instruments

What do *you* think about teaching keyboarding skills?

I am preparing curriculum materials for teaching touch-keyboarding using portable keyboards in upper elementary classrooms. I need to understand and compare teachers' preferences, needs, and opinions in order to create something most will find useful.

I know you're busy; this survey can be completed in *less than 10 minutes.* (The most crucial portion is the first page, so if you can only take 5 minutes, please *at least* complete that side.) Use the postpaid envelope to send it back to me. In exchange for your input, your school will receive a free copy of the keyboarding curriculum materials produced by this study.

Thank you so much for your help!

Gay Wiseman
gwiseman@waldenu.edu

P.O. Box 255
Dutch Flat, CA 95714
(530) 389-2872

Computer Instructor
Ophir Elementary

Candidate for the M.S. degree
"Educational Change and Technology Innovation"
Walden University ~ http://www.waldenu.edu

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Survey Instrument

Side 1

Imagine...

that your school has just made the decision to teach computer keyboarding at your grade level, and has acquired stand-alone keyboards for each student to use in your classroom for this purpose. These keyboards run on batteries, and can be used right at students' desks. It is spring, and you are asked what else you will need, to prepare for teaching this skill to your students in the fall. Check the 5 items in the list below which would be most important to you.

__ background information about the importance of teaching the skill
__ background information about how students develop keyboard skill
__ a one-day inservice class—half the time to be spent on the use, management, and care of the keyboards you will be using, and the remaining time spent on how to teach keyboarding skills
__ materials (a book and/or software) to help you improve your own keyboard skills over the summer
__ a 6-week class in keyboarding/word processing for adults which you would attend in the summer
__ motivational ideas and small rewards (stickers, certificates) for encouraging your students
__ day by day lesson plans for a 6 week skill introduction unit
__ a set of 10 minute video lessons (on VHS tape, CD ROM or Digital Video Disc) to be used in sequence, every day for 6 weeks. If you choose this one, check your preference: __VHS tape __CD ROM __DVD
__ a set of 10 minute audio lessons (on cassette or audio CD) to be used in sequence over 6 weeks If you check this one, check your preference: __ cassette __ audio CD
__ a classroom set of textbooks that contain a 6 week unit of keyboarding instruction (as well as other computer skill development units)
__ black line masters of skill drills for overhead transparencies and handouts
__ a collection of tips, curriculum integration lesson plans, and unit management advice from other teachers of keyboarding at your grade level
__ website addresses for keyboarding instruction resources and information
__ subscription to an email discussion group of people who share ideas, methods, problems and solutions related to the teaching of keyboarding

Is there anything you would want to have that is NOT included in this list?

__yes __no If yes, what?

_____

_____

_____

Look over the list again, and cross out any of the items you did not check, that you think you would not use at all, even if it/they were provided to you. Just line through ~~them like this~~.

Look over the list one more time (including any items you may have written in) and circle the checkmark of the item that would be MOST important to you if you could only have one.

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Survey Instrument

Side 2

Check the format for teaching materials that you think would be most useful:

__a binder organized with tabbed sections

__a set of floppy discs containing files you can read and print as you need them, along with a printed description of the contents and index to the files

__a CD-ROM with printable files, which also includes the audio or video lesson segments you can display on a large-screen attached to your classroom computer

Please be *opinionated* in this next section. Express yourself by agreeing or disagreeing with these purposely provocative statements. Use A for Agree; D for Disagree. If you haven't got an opinion about an item, leave it blank. (Write in comments or clarification if you wish.)

___ Keyboard skill is more important than cursive writing skill for today's students.

___ If students learn to do their writing by keyboarding too early, their handwriting skill development is likely to suffer.

___ Teachers must be skilled at keyboarding themselves, in order to teach the skill to their students.

___ Parents now expect their children to learn keyboarding at school.

___ It is harder to re-train students who have developed bad keyboard habits, than to train them when they first begin to use keyboards.

___ Students who key their writing projects do not organize their thoughts as carefully as those who write by hand.

___ Students tend to write more when they key, than they do by hand.

___ Software programs for keyboard training are very effective with students at my grade level.

___ Most students at my grade level will not use keyboard training software programs properly without close supervision.

Do students at your school currently receive specific instruction in computer keyboarding?

__yes __no. If yes, what grade? Check all that apply: __K __1 __2 __3 __4 __5 __6 __7 __8

How are lessons conducted? Check all that apply.

__ in lab
__ in classroom
__ using computers
__ using typewriters
__ using portable, stand-alone keyboards
__ conducted by computer/technology specialist
__ conducted by classroom teacher
__ with typing tutorial software, students working independently
__ teacher-supervised use of typing tutorial software

Is keyboard training currently part of a scope and sequence that your school has adopted?

__ yes __ no __ don't know __ not yet, but the plan is in the works

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Appendix B: Virtual Focus Group Documents

Permission Request for Research Involving Human Subjects

(p. 1)

Walden University

M.S. in Educational Change and Technology Innovation

PERMISSION REQUEST FOR RESEARCH INVOLVING HUMAN SUBJECTS

1. Project Title: (Use same title as Final Proposal) Keys at Their Fingertips: A Study Supporting Development of a Resource Package For the Teaching of Keyboarding Skills in Upper Elementary Classrooms Using Portable Keyboards

2. Exemption category claimed: 2 (Insert the category number from previous pages.)

3. Principal Investigator: Gay (first) B. (mi) Wiseman (last) M.S. candidate (ECTI) (degree)

Address: P.O. Box 255/898 Green Valley Rd./Dutch Flat CA 95714 (street) (city) (state) (zip)

Home Phone: 530/389 2872 Work Phone: 530/885 3495

4. Inclusive dates of project: 6/99 through 12/99

5. Check one: _____ Faculty Research _X_ Student Research

Note: The following questions must be addressed completely. A request involving survey or interviews must be accompanied by copies of the instruments which will be used to gather data. Research applications must include a consent statement or consent form appropriate to the research questions. (Use the sample form as a guide in preparing forms, letters and oral statements.) Research involving the use of pathological specimens and existing data without identifiers does not require consent from subjects.

7. Abstract/Lay Summary

Describe the research, including research questions, the purpose of the research, and methods to be used (hypothesis and methodology). Describe the task(s) subjects will be asked to complete. **Use lay language (language understood by a person unfamiliar with the area of research). Area-specific jargon should be avoided or explicitly explained.** If using existing data, records or pathological specimens, explain the sources of data, the type of tissue used, and the means of access to data. (Provide attachments as necessary.)

See attached.

8. Subject Population:

a. Number: Male:_____ Female:_____ Total: 8 to 12 (gender irrelevant)

b. Age Range: 28 to 75 approximate

c. Location of Subjects: (elementary/secondary schools, universities, public or private institutions, other) Subjects will be drawn from schools, higher ed. institutions, and private companies which produce products for keyboarding instruction.

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Permission Request for Research Involving Human Subjects

(p. 2)

d. Special Characteristics of Subjects: (mentally/physically challenged, gifted and talented, at risk, other)
none

e. If research is conducted through community agencies, written documentation of approval/cooperation from such agency (school, etc.) should accompany this application.

f. Describe how subjects will be identified or recruited. Attach recruitment information, i.e., advertisements, bulletin board notices, recruitment letters, etc.
See attached.

g. If subjects are chosen from records, indicate who gave approval for use of the records. If private medical or student records, provide the protocol for securing consent of the subjects of the records and approval from the custodian of the records.
n/a

h. Who will make the initial contact with subjects? Describe how contact is made.
This researcher will make initial contact with an email message. Content of this message is included as an attachment to this form.

i. Will subjects receive inducements before, or rewards after the study? (Note: Include this information in your consent documents.)
No

j. If subjects are school children and class time is used to collect data, describe in detail the activity planned for non-participants. Who will supervise those children? (Note: Include this information in your consent documents.)
n/a

9. Confidentiality of Data

a. Describe provisions made to maintain confidentiality of data. Who will have access to data? Will data be made available to anyone other than the principal investigator? (School officials, medical personnel?) If yes, explain below and in the consent form.
Data gathered from participants will be stored in digital form on the researcher's computer systems. Summaries and analyses made from the data will be anonymous. Researcher's project team may have access if requested.

b. Where will data be stored and for how long? If tape recordings or videotapes are created, explain who will have access and how long the tapes will be retained. Written consent is required for recordings; the consent form should include this information as well.
Original data and back up files will be erased one year after project completion.

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Permission Request for Research Involving Human Subjects

(p. 3)

10. Informed Consent Process

Simply giving a consent form to a subject does not constitute informed consent. Using the sample attached, prepare and attach a consent form, statement, or letter for review (for exemption categories 1, 2, 3, 5, 6).

Note: Researchers are cautioned that consent forms should be written in simple declarative sentences. The forms should be jargon-free. Foreign language versions should be prepared for any applicable research.

a. Consent form: Signature of subject and/or parent is required for research involving risk, and for research where a permanent record of results are retained (including videotapes).
b. Consent Statements/letters to subjects: Statements read to study subjects or distributed to participants prior to interview or as a cover sheet for a written survey should be modeled after the sample consent form, but do not require signature.
c. No active consent is required for observations of public behavior. Photos, films, videotaping, etc., require review by the Program Director and written consent of subjects. No active consent is required for review of public records, private records already stripped of identifiers, or research involving pathological specimens which are not identifiable by name or number.

11. Exempt Category #5: Public Service Programs

In addition to the information provided under *abstract*, above, provide documentation of conformity to the requirements for category #5, including written documentation or cooperations from the public agency involved in the research.

12. Exempt Category #6: Taste Testing

To be eligible for this category of research, all food tested must be GRAS (Generally Recognized As Safe) and wholesome. Food ingredients must be at or below the levels found to be safe by federal regulatory agencies. Describe the food to be tested and provide assurance that these conditions are met.

Applications for approval to use human subjects in research require the following assurances and signatures:

(Note: original inked signatures are required; no stamps or "per" signatures accepted.)

The signatures below certify that:

a. The information provided in this application form is correct.
b. The Principal Investigator will seek and obtain prior written approval from the Program Director in the event of any substantive modification in the proposal, including, but not limited to changes in cooperating investigators and agencies, as well as changes in procedures.
c. Unexpected or otherwise significant adverse events in the course of this study will be promptly reported.
d. Any significant new findings which develop during the course of this study which may affect the risks and benefits to participation will be reported in writing to the Program Director and to the subjects.
e. The research may not and will not be initiated until final written approval is granted.

This research, once approved, is subject to continuing review and approval by the Program Director. The Principal Investigator will maintain complete and accurate records of this research.

If these conditions are not met, approval of this research could be suspended.

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Permission Request for Research Involving Human Subjects

(p. 4)

Signature of Principal Investigator: Gary Wiseman Date: 8/23/99

As Program Director, I assume responsibility for ensuring that the student complies with University and federal regulations regarding the use for Human Subjects in research. I acknowledge that this research is in keeping with the standards set by the University and assure that the Principal Investigator has met all the requirements for review and approval of this research.

Signature of ~~Program Director~~: Assoc. VP/A Ode Good Date: 9/16/99

~~Gwen Hillesheim, Ed.D.~~
Ode Good

Submit to:
Gwen Hillesheim, M.S. Program Director, Walden University, 155 Fifth Ave. S., Minneapolis, MN 55401

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Permission Request for Research Involving Human Subjects

Attachment to Permission Request for Research Involving Human Subjects
Researcher: Gay Wiseman
Project Title: Keys at Their Fingertips

---

7. Abstract/Lay Summary

This project will result in a package of information and resources to help teachers at the upper elementary grade levels effectively teach keyboarding skills to their students using portable keyboards. One of the research methods to be used in the project is a focus group interview with educators who have experience doing just this. Since these experts are scattered geographically and it would be prohibitively costly to physically assemble them, this focus group interview will be conducted "virtually", using email.

The email interview process will take place over 15 days, and will comprise a sequence of five questions. The researcher will summarize the responses to each question, and share that summary with the entire group before asking the next question. Participants may offer further comment on earlier topics if they choose; those comments will also be included in the data analysis.

8. f. Focus group participants will be solicited from a list of individuals compiled by the researcher who can be contacted via email, and who...

- are authors of contemporary published work in the field, or,
- have created websites or curriculum material on keyboarding instruction, or,
- have posted significant contributions to internet listserves or discussion groups on keyboarding instruction topics, or,
- have been recommended by others as experts in the field

Each of these people will be solicited via an email message which describes the project and invites their participation (copy attached). Their responses will provide the information needed to select the group participants according to the criteria described in the Reseach Methods Approval document.

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Research Methods Approval

Walden University - MS Research Methods Approval Form http://www.waldenu.edu/forms/printable/masters/ms_form8.html

approved by AVP AA 9/16/99 DW

Research Methods Approval

Instructions: Please complete this form in order to secure approval for collecting research data or information from sources. Included are experiments involving human subjects, surveys, structured interviews, and other methods of gathering research information from sources other than published materials. This approval process documents the human subject review function. Attach this form to the research proposal, the data collection instruments, correspondence with the sources, and release forms. Please use the back of this form if additional space is required to complete the following items. Return the completed form to your Program Director.

Student: Gay Wiseman Program: M.S. in ECTI

Address: P.O. Box 255 / Dutch Flat CA 95714

Phone Numbers: (h) 530/389 2872 (w) 530/885 3495 Alpha #

Title of Research: Keys At Their Fingertips

Purpose of Research (reseach questions or objectives):

See reverse.

Population and Sample: Eight to twelve people who have experience teaching computer keyboarding skills to elementary age students using portable keyboards will constitute a focus group.

How are the sources or subjects chosen? What consent and confidentiality information is to be given to the sources or subjects?

See reverse.

How will the results be used? Research Paper X Publication ____ Product Development X

Researcher's signature and date: Gay Wiseman Aug. 23, 1999

Advisor/Instructor's Signature and date: DW Aug 23 1999

Decision: ____ Approved ____ Not approved Date: ____

Remarks:

Program Director Signature and date: ____

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Research Methods Approval

(attachment)

Purpose of Research

Objectives: This research project will result in a package of information, teaching tools, and instructional resources for supporting classroom keyboard skill instruction in the upper elementary grades. The materials will be specifically designed around the use of portable keyboards which have different capabilities and limitations for keyboard training than typewriters or computer systems that have been used for this kind of training in the past.

Research question: What background information, specific teaching tools, and learning resources should be included in this package?

How are the sources or subjects chosen? What consent and confidentiality information is to be given to the sources or subjects?

Focus group participants will be solicited from a list of over 60 individuals who can be contacted via email, and who...

- are authors of contemporary published work in the field, or,
- have created websites or curriculum material on keyboarding instruction, or,
- have posted significant contributions to internet listserves or discussion groups on the topic, or,
- have been recommended by others as experts in the field

From these, eight to 12 will be identified who :

- have experience teaching keyboarding to elementary age students, and
- have experience using portable keyboards for keyboarding instruction, and
- who are willing and able to participate.

The initial contact with each individual will be made via email in which they will be asked to answer questions which describe their own relevant qualifications. The most basic qualification for inclusion is that an individual have experience teaching keyboarding using portable keyboards at any K-8 grade level. If more than 12 of those solicited meet this qualification, the following procedure will be used to rank participants for selection:

1) Rank all according to their total number of years of experience teaching elementary grades. Assign each person the number of points associated with that rank, so that if there are 20 people being considered, #20 will be the one with the most years of experience, and #1 will have the least. Individuals with the same total number of years experience will be differentiated for ranking according to their years of experience with the target 4th, 5th, and 6th grade levels.
2) Assign additional points to each according to this schedule:
   Each year teaching keyboarding to students in grades K-3 or 7-8 = +1 pt
   Each year teaching keyboarding to students in grades 4, 5, or 6 = +3 pts
   Each year teaching keyboarding using portable keyboards = +5 pts
3) Any point ties at will be broken by comparing the total number of students to whom each individual has taught keyboarding. The twelve individuals with the most points will then comprise the focus group.

Regarding confidentiality, potential participants will be told in the initial contact that, "Discussion responses elicited through the virtual focus group experience will be analyzed anonymously for the purpose of this research study; your permission will be specifically requested for the use of any direct quotes."

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Invitation to Participate in the Virtual Focus Group

(printout from email, p. 1)

[potential focus group participants,8/23/99 9:35 AM -0700,keyboarding "virtual 1

To: [potential focus group participants
From: Gay Wiseman <gwiseman@waldenu.edu> «Dominant»
Subject: keyboarding "virtual focus group" invitation
Cc:
Bcc:
X-Attachments:

Hello,

I am compiling resources to help 4th, 5th and 6th grade teachers effectively and efficiently teach keyboarding skills using portable keyboards right in their classrooms. Perhaps you can help.

There are several models of battery-operated portable keyboards available today which make integrated keyboarding/language arts/communication skills instruction truly feasible for ALL upper elementary classrooms--but most classroom teachers have not been trained to teach keyboarding skills. I conceived this project initially to meet the needs of teachers in my two small rural districts, but I have broadened the purpose and will make the package of resources available to anyone via the internet.

My review of literature related to keyboarding instruction raises questions I would like to discuss with individuals who have more experience than I, so I am preparing a focus group interview to address these issues. Since people with the expertise are widely scattered geographically, the group will assemble virtually, via email. I am seeking teachers and keyboarding instructors who have experience with BOTH portable keyboards AND elementary age kids to participate. I learned of you through... [plug in appropriate individual info here].

This "virtual focus group" will share ideas via email over the 15-day period between... [dates to be determined]. It will require approximately 2.5 hours total time, spread out over the 15 days; and there will always be two to three days to respond to a question or discussion prompt. An open-ended question will start the process; I will summarize the responses anonymously, and share the summaries with everyone in an email message which precedes the next question. A series of five questions over 15 days will complete the exchange. I hope that through the sharing of the summarized responses a deeper dialogue may be created than might be obtained with individual survey instruments, and that the feedback from others will help maintain everyone's interest. Discussion responses elicited through this virtual focus group experience will be analyzed anonymously for the purpose of this research study; your permission will be requested for the use of any direct quotes.

Do you have the background I am looking for? Are you interested in participating? If so, please reply to this message answering the questions at the bottom, which will allow me to quantify the experience represented by the group. (This will be the only tedious part of the whole experience, I promise!)

Thanks SO MUCH for your time!
Please reply by ... [allow 3 days].

Gay Wiseman
gwiseman@waldenu.edu

Computer Instructor and Technology Consultant
Ophir Elementary School/Alta-Dutch Flat Elementary School
(Two small one-school districts in rural northern California)

Candidate for the M.S. Degree in "Educational Change and Technology Innovation"
Walden University
---

1) How many TOTAL years teaching experience do you have with elementary age students?
After the total, please indicate the number of years with each grade.

Printed for Gay Wiseman <gwiseman@waldenu.edu> 1

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Invitation to Participate in the Virtual Focus Group

(printout from email, p. 2)

[potential focus group participants,8/23/99 9:35 AM -0700,keyboarding "virtual 2

2) How many TOTAL years experience teaching keyboarding--all grade levels?
After the total, please indicate the number of years with different grades.
(When counting years for this, figure one year for any course of keyboarding instruction DURING a year--even though it might not have extended through the entire year.)

3) Please indicate the number of times you have taught an introductory course of instruction using PORTABLE keyboards.

4) Please indicate the approximate total number of students to whom you have taught keyboarding skills (using any and all methods).

5) Will you have the time to participate? (It will require approximately one half hour during every three day period for 15 days.)

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Text of the Focus Group Questions and Discussion Prompts

(p. 1)

Attachment to Permission Request for Research Involving Human Subjects
Researcher: Gay Wiseman
Project Title: Keys at Their Fingertips

(Virtual) Focus Group Interview of Experts
These questions will be asked of the group one at a time, via sequential email messages.

Question 1)
Imagine this scenario:

You work in a school district which has just acquired portable keyboards for all students in 4th grade and above. The primary purpose for them in the upper elementary grades is the mastery of touch keyboarding by all the students. Mastery is considered to be the point at which students can touch-key with proper technique faster than they can handwrite.

One of the teachers comes to you for help. She does not touch-key herself, and she wonders how (or if) she can prepare herself during the summer break to be able to teach the skill to her students beginning in the fall term.

CAN a teacher who has never personally mastered touch-keying effectively teach the skill? What kind of preparation/background information/support materials would you advise for this teacher? [If you are familiar with a real life situation like this, please share how it worked out!]

Question 2)
A group of teachers at this same school come to the School Board with concerns about this program. First, they want to know what part of the already jam-packed school program they should cut, in order to make time for keyboarding instruction. The Board president asks for your thoughts on this--how do you respond?

Next, they feel that the board made a mistake in purchasing the keyboards without also hiring a specialist to teach keyboarding -OR- budgeting for the training that teachers need. They feel this is comparable to buying musical instruments, but not hiring a music teacher. The Board intent was that the teachers themselves would be able to teach the skill, but the teachers feel they do not have the time or background. Can you suggest a solution?

Question 3)
The traditional and most common method for teaching keyboarding is to first introduce the home row keys, and then add the upper and lower reaches a few at a time. Several research projects have determined that the order in which letter keys are introduced really doesn't matter however--the most important thing is to get all the letters introduced as quickly as possible so that ensuing practice can be on real words and real language patterns.

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Text of the Focus Group Questions and Discussion Prompts

(p. 2)

There are several curriculum packages being marketed in which all the letter keys locations are taught in one or just a few introductory sessions using video and/or mnemonic methods to help young kids remember key locations. Some of these introduce the keys by finger "stairsteps"; others introduce the keys in alphabetic order. Once letter locations are learned, students type any material that relates to their other school work or personal interests for continued skill building (though specific practice exercises may be recommended for occasional use).

Have you yourself tried any methods with elementary students OTHER THAN the home row approach? If so, please share your experience. If not, please share your experience about the pacing and order of letter introduction you have had most success with at the elementary grade levels.

---

4)
Should any device or method be used at any point during instruction to prevent learners from seeing the keys? When, how, and... why? Traditional touch method training placed a strong emphasis on learners keeping their eyes on copy. Lots of devices and methods have been used to prevent learners from peeking at the keyboards. The skill of typing without looking was crucial for secretarial work such as transcription, but is arguably less important for composing and revising one's own work at the keyboard (which is the bulk of what students now will be doing). Is the insistence that they NOT look at the keyboard as important with these learners as it was in the past? Are there phases of keyboarding instruction during which it is less or more important? What is your practice regarding whether or not (and how), you prevent, or encourage, visual access to the keys?

---

5)
[I'm not sure yet which of these questions I will use for the last round. I intend to be flexible here, so I can be maximally responsive to answers I've received from earlier questions, dig deeper where necessary, or touch on areas that haven't yet been well addressed. Below are some possibilities. Perhaps I will throw them all out and ask respondents to choose which "they" want to respond to.]

Portable keyboards can be used in all kinds of locations. It is common to see students using them sitting cross-legged on the floor, or typing with them in their laps. Traditional touch-keying technique guides assume a desk position (as used for computer-tethered keyboards). Are there technique or health problems that will result if students use different postures on occasion? Should a teacher insist on desk or table use only, or is lap use OK, especially during the keyboard learning period? Do you teach about ergonomic principles, body awareness, or exercises to prevent possible health problems? Do you know of any resources to help with this?

Do you teach the number keys at the top of the keyboard? When? What about the 10-key? (One of the portable models I've seen has a 10-key pad built in.)

How do you assess keyboard skill development?

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Text of the Focus Group Questions and Discussion Prompts

(p. 3)

What is the optimum ratio of portable keyboards to computers in a classroom which will prevent bottlenecks for downloading and printing?

Do you have tips to share with teachers about the classroom management or routines that should be developed to help teachers with the challenge of teaching keyboarding to elementary students using portable keyboards?

Consider the ongoing monitoring of technique that needs to be done after students have initially learned all the letter key locations--can students effectively monitor each other? How might this work in the classroom setting?

Most of the portable keyboard models have small screens, making it difficult for a teacher to monitor what the students are typing. Is this a problem you've encountered in instruction? If so, how have you dealt with it?

Do you have a favorite practice routine you use with elementary students that you would like to share?

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Appendix C: Pilot Case Study

Permission Request for Research Involving Human Subjects

(p. 1)

MS Project form 3

Walden University

M.S. in Educational Change and Technology Innovation

PERMISSION REQUEST FOR RESEARCH INVOLVING HUMAN SUBJECTS

1. Project Title: (Use same title as Final Proposal)
Keys at Their Fingertips: A Study Supporting Development of a Resource Package For the Teaching of Keyboarding Skills in Upper Elementary Classrooms Using Portable Keyboards

2. Exemption category claimed: 1 (Insert the category number from previous pages.)

3.Principal Investigator: Gay B. Wiseman M. S. candidate ECTI
(last) (first) (mi) (degree)

Address: P.O. Box 255/698 Green Valley Rd./Dutch Flat Ca 95714
(street) (city) (state) (zip)

Home Phone: 530/ 389 2872 Work: 530/865 3495

4. Inclusive dates of project: 6/99 through 2/00

5. Check one: _____ Faculty Research X Student Research

Note: The following questions must be addressed completely. A request involving survey or interviews must be accompanied by copies of the instruments which will be used to gather data. Research applications must include a consent statement or consent form appropriate to the research questions. (Use the sample form as a guide in preparing forms, letters and oral statements.) Research involving the use of pathological specimens and existing data without identifiers does not require consent from subjects.

7. Abstract/Lay Summary

Describe the research, including research questions, the purpose of the research, and methods to be used (hypothesis and methodology). Describe the task(s) subjects will be asked to complete. **Use lay language (language understood by a person unfamiliar with the area of research). Area-specific jargon should be avoided or explicitly explained.** If using existing data, records or pathological specimens, explain the sources of data, the type of tissue used, and the means of access to data. (Provide attachments as necessary.)

See attachments.

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Permission Request for Research Involving Human Subjects

(p. 2)

8. Subject Population:

a. Number: Male:_____ Female:_____ Total: 1 gender irrelevant

b. Age Range:_____ to_____ The single subject will be an adult. Exact age is irrelevant to the study.

c. Location of Subjects: (elementary/secondary schools, universities, public or private institutions, other)
public elementary school in or near Placer County CA

d. Special Characteristics of Subjects: (mentally/physically challenged, gifted and talented, at risk, other)
none

e. If research is conducted through community agencies, written documentation of approval/cooperation from such agency (school, etc.) should accompany this application.

f. Describe how subjects will be identified or recruited. Attach recruitment information, i.e., advertisements, bulletin board notices, recruitment letters, etc.
See attachments.

g. If subjects are chosen from records, indicate who gave approval for use of the records. If private medical or student records, provide the protocol for securing consent of the subjects of the records and approval from the custodian of the records.
n/a

h. Who will make the initial contact with subjects? Describe how contact is made.
The researcher will make initial contact via either email message or phone call. The content of this message is included as an attachment to this document.

i. Will subjects receive inducements before, or rewards after the study? (Note: Include this information in your consent documents.)
In exchange for participation in the study the subject will keep all curriculum and resource materials used.

j. If subjects are school children and class time is used to collect data, describe in detail the activity planned for non-participants. Who will supervise those children? (Note: Include this information in your consent documents.)
n/a

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Permission Request for Research Involving Human Subjects

(p. 3)

9. Confidentiality of Data

a. Describe provisions made to maintain confidentiality of data. Who will have access to data? Will data be made available to anyone other than the principal investigator? (School officials, medical personnel?) If yes, explain below and in the consent form.

See attached.

b. Where will data be stored and for how long? If tape recordings or videotapes are created, explain who will have access and how long the tapes will be retained. Written consent is required for recordings; the consent form should include this information as well.

See attached.

10. Informed Consent Process

Simply giving a consent form to a subject does not constitute informed consent. Using the sample attached, prepare and attach a consent form, statement, or letter for review (for exemption categories 1, 2, 3, 5, 6).

Note: Researchers are cautioned that consent forms should be written in simple declarative sentences. The forms should be jargon-free. Foreign language versions should be prepared for any applicable research.

a. Consent form: Signature of subject and/or parent is required for research involving risk, and for research where a permanent record of results are retained (including videotapes).
b. Consent Statements/letters to subjects: Statements read to study subjects or distributed to participants prior to interview or as a cover sheet for a written survey should be modeled after the sample consent form, but do not require signature.
c. No active consent is required for observations of public behavior. Photos, films, videotaping, etc., require review by the Program Director and written consent of subjects. No active consent is required for review of public records, private records already stripped of identifiers, or research involving pathological specimens which are not identifiable by name or number.

11. Exempt Category #5: Public Service Programs

In addition to the information provided under *abstract*, above, provide documentation of conformity to the requirements for category #5, including written documentation or cooperations from the public agency involved in the research.

12. Exempt Category #6: Taste Testing

To be eligible for this category of research, all food tested must be GRAS

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Permission Request for Research Involving Human Subjects

(p. 4)

(Generally Recognized As Safe) and wholesome. Food ingredients must be at or below the levels found to be safe by federal regulatory agencies. Describe the food to be tested and provide assurance that these conditions are met.

Applications for approval to use human subjects in research require the following assurances and signatures:

(Note: original inked signatures are required. no stamps or "per" signatures accepted.)

The signatures below certify that:

a. The information provided in this application form is correct.
b. The Principal Investigator will seek and obtain prior written approval from the Program Director in the event of any substantive modification in the proposal, including, but not limited to changes in cooperating investigators and agencies, as well as changes in procedures.
c. Unexpected or otherwise significant adverse events in the course of this study will be promptly reported.
d. Any significant new findings which develop during the course of this study which may affect the risks and benefits to participation will be reported in writing to the Program Director and to the subjects.
e. The research may not and will not be initiated until final written approval is granted.

This research, once approved, is subject to continuing review and approval by the Program Director. The Principal Investigator will maintain complete and accurate records of this research.

If these conditions are not met, approval of this research could be suspended.

Signature of Principal Investigator: Gay L. Wiseman Date: 1/7/00

As Program Director, I assume responsibility for ensuring that the student complies with University and federal regulations regarding the use for Human Subjects in research. I acknowledge that this research is in keeping with the standards set by the University and assure that the Principal Investigator has met all the requirements for review and approval of this research.

Signature of Program ~~Director~~: Dale W. Good Date: 1/27/00

~~Gwen Hillesheim, Ed.D.~~

AVAIA Dale W. Good

Submit to:
Gwen Hillesheim, M.S. Program Director, Walden University, 155 Fifth Ave. S., Minneapolis, MN 55401

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Permission Request for Research Involving Human Subjects

(attachment)

Attachment to Permission Request for Research Involving Human Subjects
Researcher: Gay Wiseman
Project Title: Keys at Their Fingertips

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7. Abstract/Lay Summary

This project will result in a package of information and resources to help teachers at the upper elementary grade levels effectively teach keyboarding skills to their students using portable keyboards. The final research method to be used in the project is this one, a pilot case study of one teacher's initiation of a program of keyboarding instruction using the materials assembled and produced by the researcher.

The main purpose for this part of the project is to identify areas of weakness both in content and design in order to guide further development. Additionally, this pilot case study will help determine methods for more extensive testing of the product in future.

8. Subject Population

f. Describe how subjects will be identified or recruited. Attach recruitment information, I.e., advertisements, bulletin board notices, recruitment letters, etc.

A potential subject for this phase of the research was identified when this project was proposed, and she was listed in the section of the approved proposal "Resources and Project Support". There is a possibility that she will be unable to participate because of scheduling limitations at the time this part of the study must be done. The researcher has learned of several other potential subjects who may meet the criteria. If necessary, these individuals will be solicited for the study in order of their geographical proximity to the researcher, until one is found who does indeed meet all criteria as specified in the research methods design, and who is able and willing to participate. Such solicitation will be conducted by email or by phone, once approval to begin the study is received. A copy of the recruitment invitation is provided with this document.

9. Confidentiality of Data

a. Describe provisions made to maintain confidentiality of data. Who will have access to data? Will data be mad available to anyone other than the principal investigator?

The records of this research will be kept private. The identity of the subject will be held confidential by the researcher, but will be provided to the researcher's project committee upon request. In any report published, no information will be included that will make it possible to identify the subject without the subject's written permission in each instance.

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Research Methods Approval

Research Methods Approval

Instructions: Please complete this form in order to secure approval for collecting research data or information from sources. Included are experiments involving human subjects, surveys, structured interviews, and other methods of gathering research information from sources other than published materials. This approval process documents the human subject review function. Attach this form to the research proposal, the data collection instruments, correspondence with the sources, and release forms. Please use the back of this form if additional space is required to complete the following items. Return the completed form to your Program Director.

Student: Gay Wiseman Program: M.S. in ECTI

Address: P.O. Box 255 / Dutch Flat Ca 95714

Phone Numbers: (h) 530/389 2872 (w) 530/885 3495 Alpha #

Title of Research: Keys at Their Fingertips

Purpose of Research (reseach questions or objectives):

See reverse.

Population and Sample:

This pilot case study will examine one teacher's use of the project materials to initiate a program of keyboarding instruction.

How are the sources or subjects chosen? What consent and confidentiality information is to be given to the sources or subjects?

See reverse.

How will the results be used? Research Paper X Publication ____ Product Development X

Researcher's signature and date: Gay Wiseman 1/7/00

Advisor/Instructor's Signature and date: 1/4/00

Decision: X Approved ____ Not approved Date: 1/27/00
Remarks:

Program Director Signature and date:

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Research Methods Approval

(attachment)

Keys at Their Fingertips:
A Study Supporting Development of a Resource Package for the Teaching of Keyboarding Skills in Upper Elementary Classrooms Using Portable Keyboards

Purpose of Research

Objectives: This research project will result in a package of information, teaching tools, and instructional resources for supporting classroom keyboarding skill instruction in the upper elementary grades. The materials will be specifically designed around the use of portable keyboards. This final phase of the research project will be a pilot case study of one teacher's experience using the materials to initiate a program of keyboarding instruction. Its purpose is to identify areas of weakness both in content and in design. The information gained from this pilot case study will serve as a guide for further development. The pilot case study will also help determine methods for more extensive and comprehensive testing of the product's effectiveness in future.

How are the sources or subjects chosen? What consent and confidentiality information is to be given to the sources or subjects?

The subject for this study will be a 4th, 5th, or 6th grade teacher, with little or no experience teaching keyboarding, who also (a) has access to a class set of portable keyboards for student use, (b) is in a position to initiate a program of keyboarding instruction with his or her own students during the time period in which this study must be conducted, and (c) works at a school geographically near the principal researcher so that interviews can be easily arranged. An individual who meets all these criteria was identified when this project was proposed, and she was listed in the section of the approved proposal "Resources and Project Support" (Donné Westmoreland). There is a possibility that she will be unable to participate because of scheduling rigidity at the time this part of the study must be done. The researcher has learned of several other potential subjects who meet the criteria. If necessary, these individuals will be solicited for the study in order of their geographical proximity to the researcher, until one is found who is able and willing to participate. Such solicitation will be conducted if necessary by email or phone, once approval to begin the study is received.

The selected subject will be asked to sign a consent form (copy attached). The identity of the subject will be held confidential by the researcher, but will be provided to the researcher's project committee upon request.

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Research Methods Approval

(attachment)

Attachment to Research Methods Approval Request
Researcher: Gay Wiseman
Project Title: Keys at Their Fingertips

Pilot Case Study Research Method

Research design and method of data collection

This pilot case study will examine a single instance of the implementation of the product that was produced as a result of earlier phases of this project. The product, a keyboarding curriculum package entitled "First Things First", is intended to provide all the resources an upper elementary teacher will require in order to begin teaching keyboarding skills to his or her own students using portable keyboards in the classroom. This last phase of the project is intended to test whether it does indeed do that. This implementation case study will identify areas of weakness in both the content and design of the product in order to guide further development and further testing.

Data to be collected

The data will be of two types:

1. Answers to questions that the researcher will ask in two interviews with the subject. These interviews may be tape recorded for future reference and verification, but the researcher will primarily rely on written notes when summarizing this data.
2. Performance tasks. The subject will be asked to demonstrate skills for the interviewer just as he or she would for students during instruction. The researcher will note whether the subject accurately demonstrates several crucial keyboarding technique elements. The subject will also be asked to locate specific resources in the materials while the researcher times how long it takes, and notes what path through the materials is followed.

Preparing the subject

The subject will be provided in advance with a form for keeping notes while reviewing the materials in order to help him or her be prepared to answer accurately the questions that will be asked in the interviews. He or she will also be asked to make notes of time spent examining the curriculum materials, becoming comfortable using the portable keyboards (if necessary), and otherwise preparing for instruction.

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Research Methods Approval

(attachment)

Keys at Their Fingertips:
A Study Supporting Development of a Resource Package for the Teaching of Keyboarding Skills in Upper Elementary Classrooms Using Portable Keyboards

Solicitation of a Subject for the Pilot Case Study

If it becomes necessary to solicit a subject for this study (other than the person previously identified in the project approval process) the researcher will contact persons who have been referred by colleagues as being likely to meet the criteria specified in the research methods design.

The following message will be used for the initial contact with such a potential subject. This contact will be made either by email or by phone, depending on the information the researcher has received from the referring colleague.

"Hello [contact' s name] ,

My name is Gay Wiseman, and I am producing a curriculum package for teaching keyboarding skills using portable keyboards (such as AlphaSmarts) in any 4th, 5th or 6th grade classroom, which has this equipment. The project is part of my Masters program at Walden University. I am looking for a teacher willing to test these materials.[Referrer' s name] thought you might be a good candidate. Are you interested?"

If no, "Thank you for your time." (That' s if by phone; if by email, or if the person expresses interest in participating, the message will continue as follows.)

"These are the criteria I need in a tester:

1) a 4th, 5th, or 6th grade teacher;
2) who has little or no experience teaching keyboarding;
3) who has access to a class set of portable keyboards for student use;
4) who is in a position to initiate a program of keyboarding instruction with his or her own students during the time period in which this study must be conducted [insert dates] ;
5) and who works at a school no more than two hours drive from the principal researcher (Placer County, CA)

Do you meet these criteria?

When would be a convenient time for me to bring you a consent form to review, and the materials to be used in the study?"

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Participant Consent Form

Side 1

Keys at Their Fingertips:

A Study Supporting Development of a Resource Package for the Teaching of Keyboarding Skills in Upper Elementary Classrooms Using Portable Keyboards

Consent Form

You are invited to participate in a research study to test curriculum material designed for teaching keyboarding using portable keyboards in the upper elementary classroom. You were selected either because you are known to the principal researcher who believes you meet the following criteria, or because you were recommended to the researcher by a colleague who believed you meet these criteria:

- 4th, 5th, or 6th grade teacher;
- has little or no experience teaching keyboarding;
- has access to a class set of portable keyboards for student use;
- is in a position to initiate a program of keyboarding instruction with his or her own students during the time period in which this study must be conducted,
- works at a school no more than two hours drive from the principal researcher (Placer County, CA)

Please read this form and ask any questions you have before agreeing to be in the study.

This study is being conducted by Gay Wiseman, Candidate for the M. S. Degree in Educational Change and Technology Innovation at Walden University.

Background information

This case study of one teacher's experience using this product to initiate keyboarding instruction is intended to identify areas of weakness both in content and in design. This information will help to identify methods for more extensive and comprehensive testing of the product's effectiveness in future, and will guide further development.

Procedures

Participation will require that the subject will

- spend a minimum of one hour reviewing the materials prior to beginning a program of instruction;
- make notes on any errors found in the materials, of questions which arise while reviewing the materials, and of time spent preparing for instruction (form will be provided);
- be (or become) knowledgeable about how to use the portable keyboards which will be used by students during the program of instruction;
- initiate a program of keyboarding instruction with students using the materials;
- meet with the researcher on two occasions at a consensual time and place for interviews of approximately 30 minutes each which will be tape recorded.

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Participant Consent Form

Side 2

Risks and Benefits of Being in the Study
There are no known risks inherent to participation in this study. The participant may benefit by the increased knowledge and experience about keyboarding instruction which participation will entail.

Compensation
Curriculum materials used in this study will become the property of the participant after all procedures listed above are completed.

Confidentiality
The records of this research will be kept private. In any report published, no information will be included that will make it possible to identify the subject without the subject's written permission in each instance. Research records, including tape recordings and interview transcripts, will be stored in the principal researcher's private office and in personal computer data files; these are not publicly accessible. No individuals other than the researcher's project committee at Walden University will have access to any data produced by this study which can lead to identification of the subject.

Voluntary Nature of the Study
Your decision whether or not to participate will not affect your current or future relations with Walden University, or with your own place of employment. If you decide to participate, you are free to withdraw at any time without affecting those relationships. If you do withdraw from the study before completion, all materials (and any copies made of any of the materials) must be returned to the researcher.

Contacts and Questions
The researcher conducting this study is

Gay Wiseman
P.O. Box 255 / Dutch Flat CA 95714
Eve: (530) 389-2872 / Voicemail: (925) 695-2031 x0006
Email: gwiseman@waldenu.edu

The Walden University project advisor for this study is

Linda Crawford
2840 44th Avenue South / Minneapolis, MN 55406-1825
Day - (612)391-7081 / Eve - (612)721-4264
Email: lcrawfor@waldenu.edu

You will be given a copy of this form to keep for your records.

Statement of Consent
I have read the above information. I have received answers to any questions I asked about the study. I consent to participate in the study.

Signature: confidential Date: Jul 4 2000

Signature of Researcher: [signature] Date: 7/4/2000

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Interview Questions

(p. 1)

Questions and tasks for the first interview

During the first or second week of the implementation of the instructional program, the researcher will interview the subject in order to learn these things:

How long did the teacher spend reviewing the materials preparatory to initiating instruction?

Does the teacher feel that was adequate preparation time?

Has the teacher found errors in the materials? (identify)

Did the teacher expect to find anything in the materials that wasn't there?

Regarding the organization of the materials--was the teacher able to find things when needed?

Did the teacher feel confident about initiating the instruction? How does the teacher rate confidence level on a scale of zero to five? (A "five" would indicate they felt enthusiastic and unhesitating; "zero" would indicate so little confidence that instruction was not initiated as scheduled.) If the teacher reports low confidence, a further question will ask about the nature of the apprehension. Is it caused by: (a) lack of personal skill in keyboarding, (b) lack of knowledge of how to teach the skill, (c) discomfort using the portable keyboards, (d) general apprehension that commonly attends beginning an unfamiliar course of instruction, (e) something else?

Can the teacher now find certain specific items quickly and easily on request?

- letter to parents
- technique evaluation chart
- mnemonic poem for remembering fingering
- blank keyboard master
- a specific lesson plan
- a specific practice exercise

How does the teacher describe the baseline of his or her students' touch-keyboarding skills before the program was started?

Did the teacher make use of:

- the weekly planner section?
- the parent letter? (printed or disk version?)
- the wall chart?
- the video clip(s)?

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Interview Questions

(p. 2)

- the fingering poem?

Is the teacher able to demonstrate proper keyboarding technique to students? (e.g., curved fingers resting lightly in home base position; body, arm, and leg posture; correct finger reaches; shift key technique; a quick "chicken peck" key-stroke action.)

Questions and tasks for the second interview

During the third or fourth week of the implementation of the instructional program, the researcher will interview the subject once more in order to learn these things:

How does the teacher describe the student learning experience so far in the instructional program? Do students seem motivated to learn? Are they making progress using all fingers while not looking at the keys? How does the teacher describe their attitudes at this time about mastering this skill?

Has the teacher found further errors or omissions in the materials since the first interview?

Is the teacher able to identify technique problems when the interviewer demonstrates them?

What suggestions for improvement to the materials does the teacher have?

Would the teacher use the materials again after the study is over?

Would the teacher recommend the product to other teachers?

Analysis of the interview data

Data gathered in the interviews will be described in narrative form and used as the basis of recommendations for revision and development of the product, as well as for its further testing.

Reviewer's Notes

The following form will be provided to the subject with the curriculum materials. The teacher will be asked to use this form for keeping notes while preparing to conduct the instruction. The form is intended to help the subject be prepared to accurately answer questions during the interviews. The researcher will not collect the form itself.

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Reviewer's Notes

(p. 1)

"First Things First"

Keyboarding Skills Curriculum

Reviewer's notes

The topics below are the things you will be asked about during the two interviews in this study. Review the items now, so you will understand the areas in which your input is needed. You may use this page for keeping notes that will help you be accurate in your answers. If you need more room, feel free to add a page.

During the interviews, you will also be asked to demonstrate some of the basic keyboarding techniques such as finding the home position for the hands without looking and how to use the shift key for capitals just as you will demonstrate those skills for students. If you have never learned to touch-key, allow time to practice these skills.

Please keep track of the time you spend reviewing the materials, planning and scheduling the lessons, practicing skills, and otherwise preparing to begin this instructional unit. Include any time you spend (if applicable) familiarizing yourself with the use of the portable keyboards your class will be using.

Date	*How much time?*	*Doing what?*

Errors I noticed in the materials:

Omissions I noticed:

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Reviewer's Notes

(p. 2)

Questions that came to mind as I reviewed the materials and prepared for instruction:

Questions my students asked that I wasn't prepared to answer:

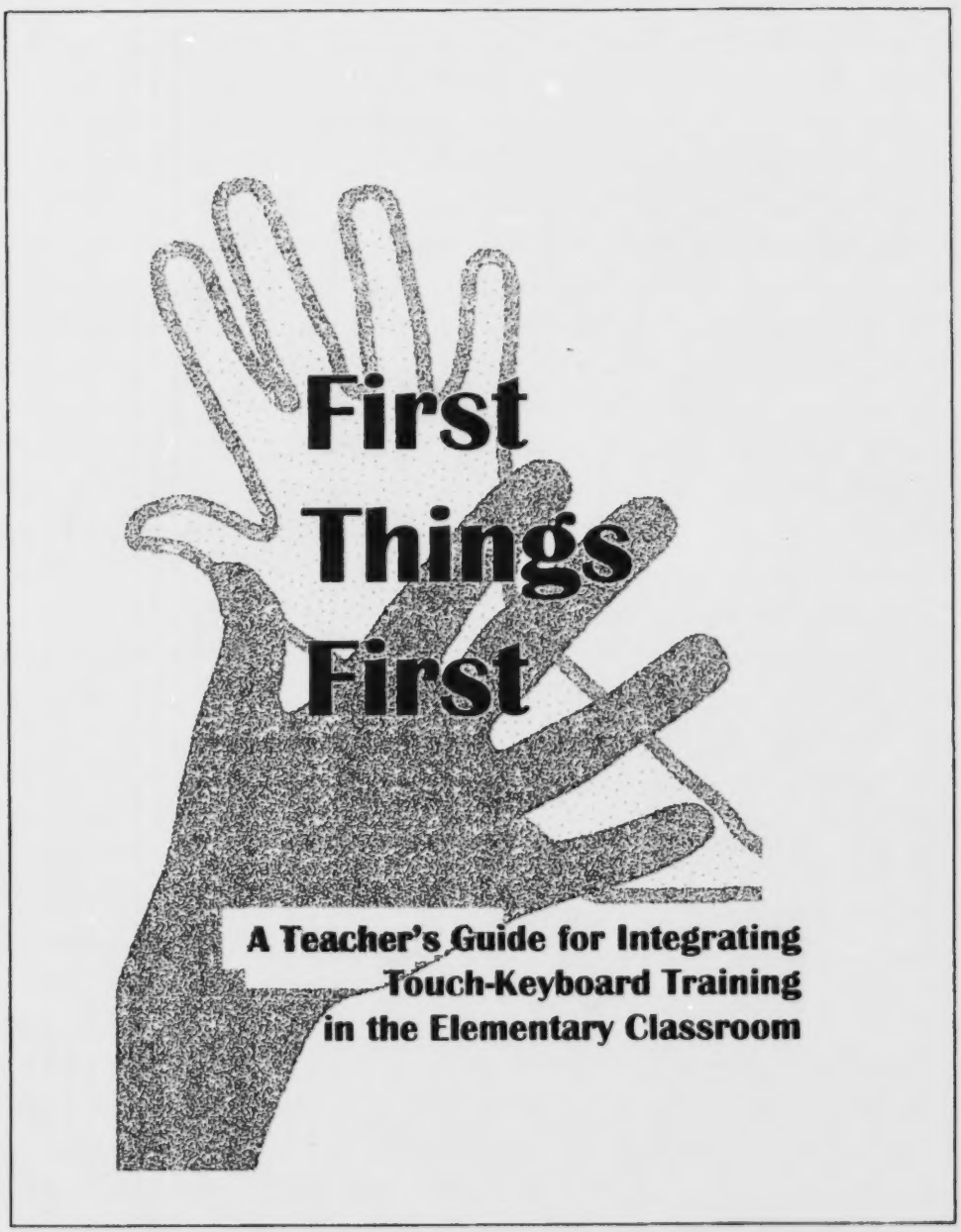
Things I like about this instructional program:

Things I don't like about this instructional program:

Suggestions for improvement:

Appendix D: *First Things First: A Teacher's Guide for Integrating Touch-Keyboarding Instruction in the Elementary Classroom*

A reduced copy of the product resulting from this research project is appended. The original was produced in 3-ring binder form, with tabbed section dividers, and with pocket dividers for organizing unpunched blackline masters and overhead transparencies. The location of these elements is noted in brackets where applicable.



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First Things First: A Teacher's Guide for Integrating
Touch-Keyboard Training in the Elementary Classroom

DRAFT version • work in progress

©2000, Gay Wiseman

Comments welcome.
Contact the author:
gwiseman@waldenu.edu
P.O. Box 255 • Dutch Flat, CA 95714

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Preparing to Teach Touch-Keyboarding

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Websites • Email support • Inservice Training

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About the author...

Gay Wiseman is currently a computer lab teacher at Ophir Elementary School in the Sierra Nevada foothills of northern California. This instructional program was conceived and developed as part of the work required for her Master of Science Degree in Educational Change and Technology Innovation at Walden University.

The instructional model presented here continues to evolve, thanks to input from other teachers and keyboarding instruction specialists. Feedback is welcome.

Gay Wiseman
gwiseman@waldenu.edu
P.O. Box 255 / Dutch Flat CA 95714

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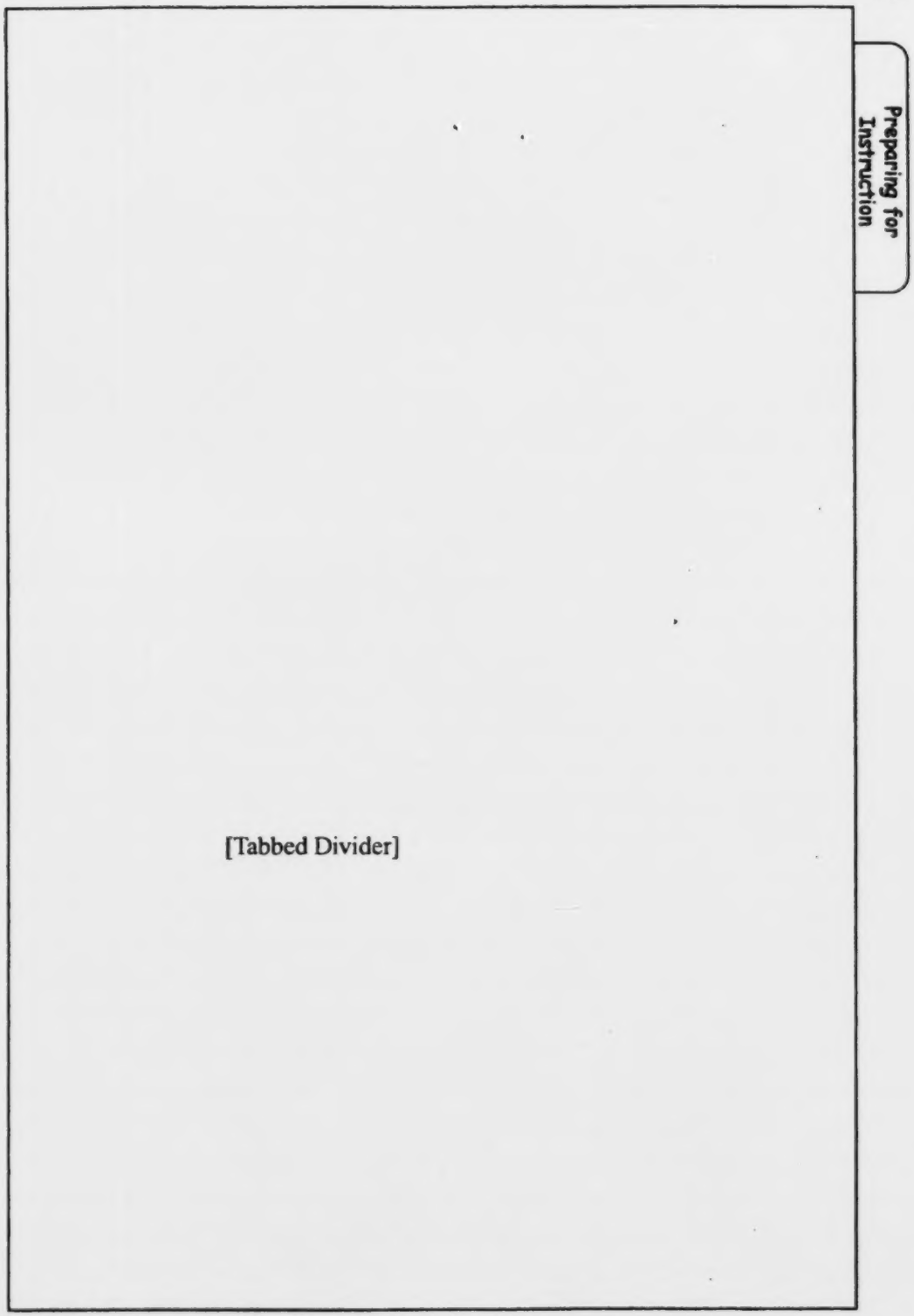
Preparing for Instruction
[Tabbed Divider]

Why THIS program? Is it for you?

This program has several features which distinguish it from other keyboarding curricula. It...

...*relies on ubiquitous keyboards* for student use. Low cost portable keyboards* are now available which not only allow students sufficient keyboarding time to develop skill and take advantage of it, but also necessitate a new focus on early touch-keyboarding instruction in order to prevent the development of very difficult-to-break bad keyboarding habits.

...*is designed for use in elementary classrooms* where students learn and practice at their usual work places, rather than in a separate room or lab. The program is specifically intended for 4th through 6th grade classes, though 3rd grade teachers may find it appropriate for their students also.

...*recognizes the crucial role of classroom teachers* and is designed for their active involvement conducting the instruction, even if they have no prior experience teaching keyboarding (and even if they do not touch-key themselves—yet!). Computer teachers or specialists may do a credible job teaching keyboarding skills in a lab setting or during classroom visits—but classroom teachers can best incorporate keyed writing projects into the rest of the school learning program; they are the ones who will be consistently on hand to monitor and guide student skill development during use; they know their students best, and can tailor instruction as needed for individuals; and, their active involvement in the instructional program lends importance to the skill in the minds of their students. When conducting this instruction themselves—in their own classrooms—with equipment always readily available—teachers are free to adjust class schedules as needed to allow sufficient time for students to accomplish the widest and most suitable variety of learning tasks requiring and reinforcing the skill. Keyboarding must now be considered a fundamental literacy skill for all students, and as such, it belongs within the scope of the instructional responsibilities of the classroom teacher.

more » »

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...recognizes that elementary students today have different learning needs and environments than traditional keyboarding instructional programs were designed for. More on that follows. See the section "Student learning goals."

...fosters an effective and smooth integration with other subject areas because spelling, writing, social studies, science, and other subject area projects do "double duty" as keyboarding practice material. The development of keyboarding skill is not treated as a separate subject to be squeezed into an already jam-packed elementary curriculum; rather, skill development is blended after the first two weeks with practical uses of the skill in learning contexts.

Warning: This program won't work in all school situations. It is not a "magic bullet" solution. It requires teacher commitment and instructional time. It assumes availability in the classroom of portable keyboards for each student, and ready access to the computers/printers required to print student work expeditiously.

First Things First: Touch-Keyboarding in the Elementary Classroom is a curriculum program that will be useful for elementary classroom teachers...

- who have the keyboarding tools available for students' use all the time;
- who understand the importance of establishing a foundation of keyboarding skill as a prelude to word processing;
- and who are willing to commit to the changes in classroom routines that are required to integrate student keyboarding skill development successfully into the school learning program.

This instructional program was conceived as a "companion piece" to the excellent portable keyboarding equipment available now. It is intended to help teachers to help their students more fully exploit the power of word and thought processing technologies.

~ • ~

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Student learning goals

Keyboarding students in U. S. schools today live in different circumstances and have different learning needs than most keyboarding curricula were designed around.

First, they are *younger*. Students must be taught keyboarding *before* they are expected to use word processors, in order to head off development of bad habits—First things first!—That new reality has pushed keyboarding instruction down from middle and high school to the elementary school. But since these learners are younger, their reading and writing abilities are lower. The first keyboarding tasks these younger students need to accomplish are really quite short and simple. The level of touch-keyboarding skill that will enable them to accomplish these tasks can be developed relatively quickly.

The goal for this initial instructional program is for students to be able to touch-key faster than they can handwrite.

7 to 15 words per minute is the average handwriting speed for this age group. When they surpass this speed, students will feel (and be) successful with touch-keying, and this will motivate them to continue their efforts to gain the level of "automaticity" which is the ultimate goal.

A second big change in students is that many now have regular access to computer keyboards *outside* of the lesson environment. Some students are quite familiar with keyboards before they receive any formal instruction, and many will have implemented a "hunt and peck" approach to computer writing tasks since their preschool years. Because these students are *already* sight-keyboarding routinely, and will likely continue to key on their own throughout the instructional period (outside the lesson environment), this program presents an instructional approach that can capitalize on that liberal keyboard access. Traditional keyboard training programs which introduce the keystrokes over a period of many weeks (or even

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months) will sabotage the efforts of today's learners, who cannot maintain their touch-keyboarding learning momentum, and must revert to two-finger sight-typing to accomplish their actual keyboarding tasks until all the characters have finally been taught. This continued fall back on the dominant sense of sight is counterproductive to the acquisition of touch skills.

It is unrealistic to expect students to forego all keyboarding activity for 6 weeks or so until they learn how to properly strike *all* the keys. It is important to help them stop their accustomed reliance on sight however, so an instructional approach that enables touch-keying of **all** the letter and common punctuation characters after just one week of hands-on instruction will allow students to use and practice proper technique **whenever and wherever they keyboard.**

~ • ~

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3 phases of keyboard skill development

All psychomotor skills are developed in phases. Think about how one learns to tie a bow knot by first memorizing the sequence of steps, practicing the sequence over and over to train the fingers, and then finally the process becomes fluid and automatic requiring no conscious thought to technique. Mastery of any skill is accomplished when the cognitive attention to the process is entirely replaced by automatic muscle responses. In between is the long period of practicing in which mental powers of association tie the recollection of a memorized routine to a muscle response. There is no short-cutting this practice period. This program is built on this three phase model.

Learners need to understand the basic facts about how psychomotor skills in general are developed, and recognize the crucial roles of *practice* and *determination* in achieving mastery of any skill. They must also recognize the patterns of the QWERTY keyboard layout, and the column pattern of finger-key responsibilities. They must learn why it's important to rely on the sense of touch rather than sight in keyboarding. These are the learning objectives emphasized during the first phase of this instructional program.

The second phase is the period when the fingering of all the letter and major punctuation keys is learned. This program uses a condensed "boot camp" approach for teaching the fingering pattern quickly, and introduces the letters in alphabetical order, using a mnemonic poem to aid recall.

Next follows phase three, the period of building and strengthening the association between a character stimulus, and the correct keystroke response. This period will require between 15 to 25 hours of keyboard time for most students. The learning goal during this phase is for students to be able to touch-key accurately faster than they can handwrite. A distinguishing feature of this program is that this lengthy period of skill-building is not comprised of letter pattern drills. For practice, students keyboard school work derived from other subject areas, such as spelling, language arts, or any writing required for science, math, social studies... the normal prose of the student's school work is used as the keyboarding practice material.

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Instructional methods

A unique feature of this program is that the initial lessons of the first phase are entirely hands-**OFF**. The *"way cool"* portable keyboards students will be using are super for keyboarding instruction—but they can be so much fun that it is often hard to keep students attentive to the lesson purpose when they have the keyboards in front of them. Taking time *first* to introduce students to the concepts of psychomotor skill development, and the pattern of finger-character assignments will prepare them to get the most benefit out of the subsequent hands-**ON** lessons.

The "fingering boot camp" period utilizes a mnemonic poem to help students memorize the fingering for all the letters in a short period (one week). Letters are introduced in alphabetic order, because that order is so familiar to both students and teachers that it is effortless to remember. The teacher describes and demonstrates each stroke, and then observes and corrects students as they practice. Students orally name each new letter as they key it, which helps build associative nerve paths connecting the letter with the finger muscle movement.

After this boot camp period, skill building centers around school work related to other subject areas, though brief, regular warm-up and booster drills are also important.

The MOST important component of ALL the hands-on instructional time is the attentive and knowledgeable monitoring of proper technique by the teacher.

It is crucial that students not slip back into bad habits before the learning has taken firm root.

~ • ~

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Scheduling the lessons

There are three phases of instruction in this program, corresponding to the three phases of psychomotor skill development, and each should be scheduled differently. The information below will guide teachers in time planning. The blank "Weekly Planner" section will help both for scheduling purposes, and for keeping track of the time students spend keyboarding for program and progress evaluation purposes.

Phase 1: Introduction Week

Phase one consists of three introductory lessons which may be spread out through one week, or delivered back to back on one day. The first two lessons will take approximately 30 minutes each. The third will take *at least* 30 minutes—perhaps an hour—try to be open-ended with this one. Allow enough time to check that all students are able to find their home position by touch, as this is the foundation for learning touch-fingering. After you've read through these three lesson plans, make your scheduling decisions based on your other time constraints and your knowledge of your own students.

Lesson 1	Psychomotor skill development; conceptual introduction
Lesson 2	the QWERTY keyboard layout
Lesson 3	Using the keyboards; anchor keys and home position; posture. Using the space bar, return key, delete key

~ • ~

Phase 2: Fingering "Boot Camp"

The second phase is the only one in which scheduling should be *very carefully planned*. Allow 30 minutes for each lesson—one each day throughout a five day week. Ideally, schedule this lesson in the morning and then give students an additional 15 minute practice time each afternoon to help the skill "set".

Lesson 4	Left hand letters A B C D E F G and the period
Lesson 5	Right hand letters H I J K L M N O and the comma
Lesson 6	Letters P Q R S T U V and the apostrophe
Lesson 7	Letters W X Y Z; review entire alphabet
Lesson 8	Shift key for capital letters; question mark, quotation marks, exclamation point

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Phase 3: Building Skill Through Use
The third phase will continue indefinitely as students build their skill. To be successful, students should key 30 minutes daily for the first four weeks of Phase 3, and at least 3 times each week throughout the entire first school year in which they learn the skill. Scheduling of this keyboarding time is very flexible however. This is *not* time withdrawn from other curriculum areas. *ANY writing task can provide the major portion of this practice time.*

Students will begin each keyboarding session by reviewing the alphabet, and then completing one of the brief practice exercises (masters included). This should only take 5 to 10 minutes. Then students will spend the rest of the allotted time making use of their keying skills to produce work you require for another subject area. Teacher preparation time throughout phase three is largely in planning suitable writing tasks which students will be able to complete successfully at their level of skill. Once every week or two, whole-class skill building exercises or speed sprints should be scheduled.

During the early weeks of phase three, it is absolutely ***crucial*** that the teacher monitor student technique during practice times. Once proper techniques are firmly established, monitoring may be sporadic.

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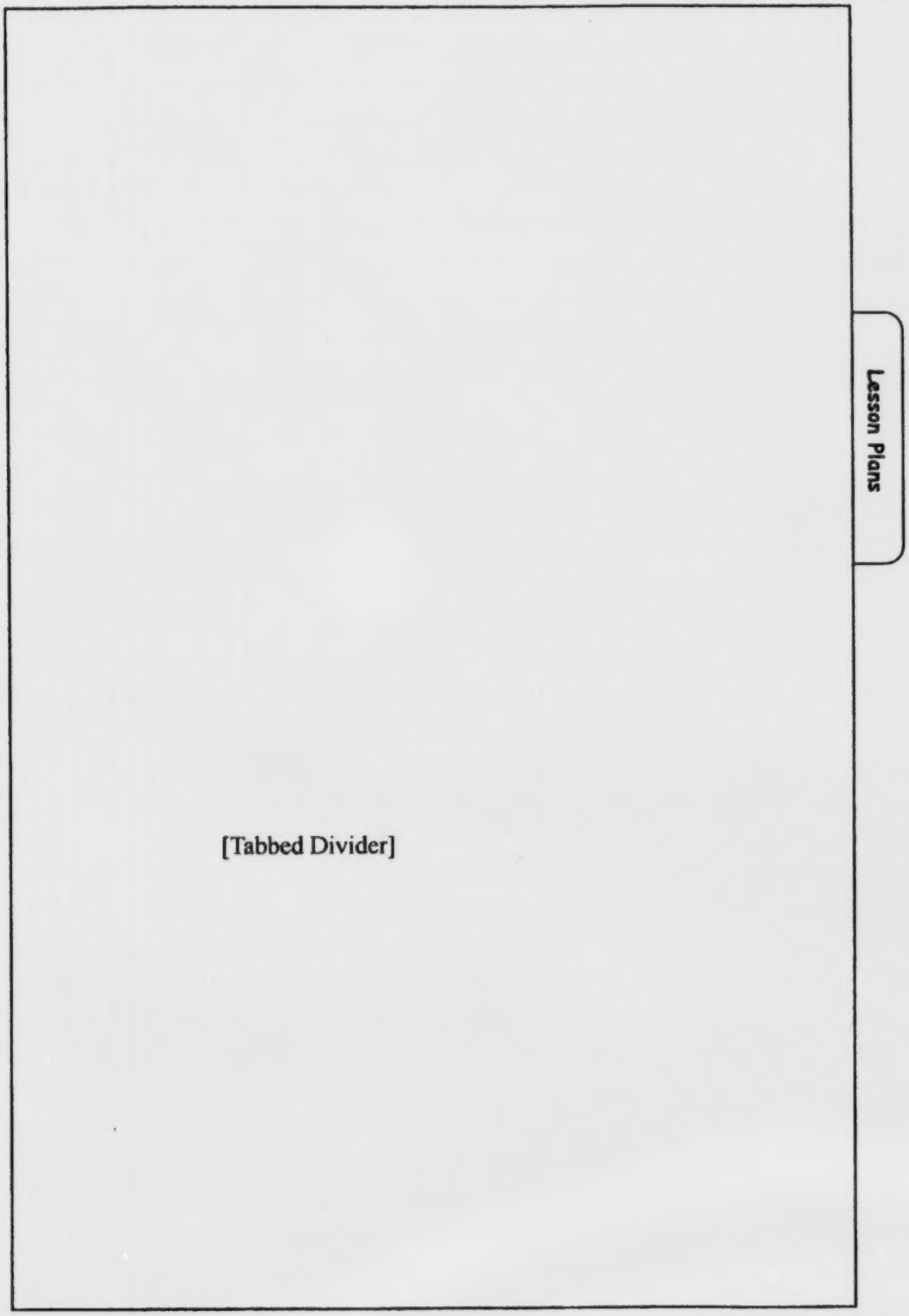
Lesson Plans
[Tabbed Divider]

Phase 1 Lesson Plans

3 Lessons • Same week
Flexible scheduling

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Lesson 1

Lesson in brief:

- Demonstrate the skill
- Discuss usefulness of the skill
- Compare to other psycho-motor skills
- Set first keyboard skill goals

Why learn to *touch*-key?

Objectives

- Students will be able to describe how touch-keyboarding skill will help them.
- Students will think about other psychomotor skills they have learned, and the roles of practice and determination in learning them.
- Students will determine their own handwriting speed, which will serve as their first personal keyboarding speed goal.

Preparation

- If you are not a skilled touch typist yourself, recruit someone who *is* to do a brief demonstration for your students at the start of this lesson. Find someone who can key 50 or more words per minute with reasonable accuracy and *without looking at the keyboard.* A portable keyboard might be used for this, but a computer with a large screen set to a large font size would be better so everyone can see the words appearing.
- Make a copy of the "Yoyo Day" page for each student. Locate the word count breakdown they will use to figure their handwriting speed.

Explain and show

Introduce touch-keyboarding instruction by showing your students a demonstration of the skill by an expert. Make sure everyone gets a good look at the fingers in action *while the eyes are looking at copy or at the screen.* Have a student hold a piece of cardboard or a binder above the keyboarder's's hands to impress upon students that the fingers are finding the keys without *any* help from the eyes.

Ask students how they think having this skill will be useful to them. Generate a group list of ways the skill can help them. (If they do not mention all of these items, pull them out with hints):

- it's the fastest way to write
- since you get your *work* done faster you have more time to *play*
- it's easy to fix your errors and it doesn't look messy
- it is easier for people to read your writing
- you can use computer spell-checkers

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Lesson 1 (cont.)

- it will help you get a better job
- it will help you chat and do email on the internet

Ask the group if they think they *can* learn to touch-key. Ask them how they think this skill is learned. Discuss how other psychomotor skills are learned. Emphasize the roles of *determination* and *practice*.

Assure students that anyone who has ever learned to tie their shoes, or ride a bike, or snap their fingers, or jump a rope, or do a cartwheel, or shuffle a deck of cards, or throw a frisbee—*can also learn to touch-key*. Like with all those other skills, people learn at different rates, but *everyone* can learn these things— if they are determined to, and if they practice enough. You might talk about how even people with physical disabilities have learned to do amazing things because they had the determination and the willingness to practice hard and long. Tell them you are going to give them enough practice time to learn to touch-key; they need to supply the determination.

Many people keyboard poorly because they are not taught the touch method from the beginning. It is hard for them ever to become very fast. Most will "top out" at a speed of around 30 to 35 words per minute no matter how much they practice. The only way they can get faster than that is to start all over again and learn to key by touch. That is very hard to do because it means they'll have to go slower while they retrain their fingers.

Touch-keyboardists easily reach 50 to 60 words per minute, and some can type over 100 words per minute!

Setting realistic incremental goals is important to prevent frustration. Since students are different, one standard words-per-minute speed goal for all will prove easy for some and frustrating to others. Have your students set their own individual speed goals by determining the speed at which they currently handwrite. That is the speed at which they will start to gain all those benefits they just listed; it is realistic for each individual because it is related to their own motor skill development level.

Students do

Students watch the demonstration and participate in the discussion. Then have them hand copy the "Yoyo Day" piece to get a handwriting speed base score. Time this carefully. Start them all at the same time, and allow exactly 4 minutes. Display the word count transparency (or printout) and help students find their total word count. They should then divide by 4 to get their WPM (words-per minute) speed.

Enter these goal speeds in the First WPM Speed Goal column on your class keyboarding progress chart.

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Lesson 2

Finger Assignments

Objectives
Students will figure out which is the correct finger to use for each letter, based on an understanding of the arrangement of the standard QWERTY keyboard.

Preparation
Mount the keyboard chart on the wall just above head level in a place where you can reach to all parts of it. If you have an overhead projector, this should be near the projection area. Find the transparency of the keyboard and have an erasable marker handy. Make a copy of the hand chart/fingering quiz (2-sided) for each student.

Explain and show
Using either the overhead or the wall chart, point out the three horizontal rows of letter keys. This is called the QWERTY layout, or the "universal" layout. Next point out how the letter keys are arranged in diagonal columns, with a number key at the top of each column. Point out that there are 10 columns from left to right (with the zero key at the head of the 10th). Ten columns, ten fingers—one finger for each column, right? Well no, not exactly. The thumbs aren't used on letter keys at all. They control only the space bar (see sidebar, page 16); that leaves only 8 fingers, so the strong pointer fingers each control 2 columns of letters at the center of the keyboard. The other fingers each control one column.

Draw a line jogging down through the keys starting between the numbers 5 and 6, then between T and Y, G and H, B and N. Explain that this line divides the keyboard into the areas controlled by each hand. Fingers should never cross that line!

Illustration of keyboard with a line to separate the hands.

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Lesson 2 (cont.)

more » »

Students do

On their hand charts, have students first write the number of the column(s) each finger controls just above the fingertip.

Then, using pieces of cardboard or books as masks over the transparency (or the wall chart) reveal the diagonal column structure of the keys by blocking all but one column at a time as you move the masks from left to right. Have students name the letters in each column as you go and write them on the

appropriate fingers of the hand chart like this:
For columns 8 and 9, they should put down the comma and period for the bottom row keys. For column 10, have them put a semicolon and a question mark for the middle and bottom row keys.

Now point to letters on the wall chart or transparency and ask questions like, "What finger controls the L key?" Spend only enough time on this to be sure that they are getting it before having them complete the fingering quiz on the reverse side of the hand chart. Leave the transparency (and/or the wall chart) visible for reference.

Before students begin using the keyboards, they should understand that the fingering rules are based on this "division of responsibility" among the fingers, and that mastering proper fingering will ultimately allow for the greatest speed and ease. Tell them they are not being taught just "any old way" to get letters on the screen. They are being taught to be *expert* keyboardists; fast and efficient computer users. They will be **POWER** users.

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Lesson 3

"There's no place like home"

Objectives

Students will be able to:

- operate all of the keyboard functions they will need during the Phase 2 "Boot Camp"
- locate the two "anchor keys" by touch, and demonstrate the "home position" of the hands
- demonstrate proper posture for keyboarding
- use the right thumb to control the space bar
- press the enter/return key with the right little finger
- press the backspace/delete key with the right little finger

Preparation

Finally students will begin to use the keyboards! Make sure each unit is charged up (or have spare batteries available). Become familiar with all the settings and controls on the keyboards, so that little time will be lost trouble-shooting during lessons.

Use student experts. Some teachers recommend selecting students to serve as class "technical experts." Have one or two students who are so inclined take a keyboard and its instruction manual home overnight or on a weekend to learn the ins and outs of their operation and settings. Perhaps choose one girl and one boy.

Some keyboard models allow the user to turn off the "auto-repeat" of keys, preventing a character from recording more than once without separate strokes. The default setting for auto-repeat is on, but it may have been turned off . It must be *on* for this lesson. If you don't have time to check all the keyboards, at least know how to change the setting if needed.

Notice which two letter keys on your keyboard model(s) have tactile positioning bumps . Some manufacturers put the bumps (or ridges) on the D and K keys; others use F and J.

There may be some models with no anchor key tactile indicators at all! In that case you should add your own tactile guides—use a standard hole punch to make sticky dots from "moleskin". (This adhesive-backed flannel is available in drug stores in the foot care section.)

These are two types of finger positioning aids found on keyboards. What kind do yours have? Some type of tactile positioning aid is essential. Touch-keyboarding skill builds from the ability to feel accurately the fingers' location on the keyboard. Your students will rely on these guides.

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Lesson 3 (cont.)

The wall chart should still be in place so you can demonstrate home position with it. Make copies of the "There's no place like home" worksheet.

Look over the worksheet, and decide ahead of time whether you want to guide your students through each step all together, or have students follow the steps themselves while you circulate. One strategy is to keep the class together through item number 5, then have them complete the rest of the items individually while you circulate and check each student's home position and posture.

Explain and show
First explain any rules for who is to use which keyboard (if it matters) and go over procedures you will want the class to follow for getting them out, storing them, and recharging them each day.

Next, distribute the worksheets and guide students through the first four items. On item 5, use the wall chart to demonstrate how to find the home position by placing the anchor fingers first—then the thumbs—then the other fingers. Have them check to see if their little fingers are on the A and the semicolon keys.

Fingers must be curved to line up on the keys properly. Point out that it's OK for the hands to be resting while they are just holding home position, but that when actually keystroking, they should keep the wrists straight or "neutral"; only the fingertips touch the keyboard.

Fingers should be curved and relaxed—not stiff or straight.

You many need to help some students find a footrest so they can keep their feet flat.

Check each student's home position, and correct any problems.

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Lesson 3 (cont.)

When you think students are ready, "test" the whole group together. Have them all keep their eyes on you while they put their hands on the top of their heads. Then on your command ("Go Home!") they should find home position *while keeping their eyes on you.* Do this several times. Learning to feel their position on the keyboard is the "key" to touch-keyboarding.

Students do

Each student should go through the worksheet items in order and complete each one. This will guide them in learning how the keyboards work through some fun experimentation. Students should be able to describe how "word wrap" works [see note below], and they should understand how the screen may only show a portion of a larger file. They should begin to get a feeling for how they can reach all the keys from the home position. They should practice a light quick tap on the keys and on the space bar. Some students will need quite a bit of time to master this quick tap stroke—they will discover that the character repeats if they "press" a key rather than tap it.

- - -

Space bar—though some keyboarding instructors pursuit the use of either thumb on the space bar, teach your students to use only the right thumb. There is a new keyboard design that splits the space bar in half, with the left half serving as the delete/backspace key (which makes great good sense!) If this keyboard design gains popularity, it will be easier for students to adapt to it if they haven't already trained the left thumb to another task.

Supplemental notes keyed to the Lesson 3 worksheet items:

7. This automatic flow of letters to the next line is called "word wrap". The keyboard (or a computer) automatically "flows" your letters to the next line. With old typewriters, you had to use a lever or special key to "return" to the left side of the page for every new line. Computer keyboards do this automatically. Now you only need to use the return key to start new paragraphs, or when you want to "return" to the left edge and start a new line. It is very useful for making lists. You should NOT use the return key at the end of lines EXCEPT for lists and starting new paragraphs. If you do, those invisible commands will prevent your words from adjusting properly to any later changes you might make to a different type size or style. It's a big hassle to fix that later.

9. Using the wall chart, demonstrate how to hold the anchor finger in place, and pivot the hand so that the little finger can reach the backspace/delete key. [Some keyboards label this key "backspace" Use whichever term your keyboards use.]

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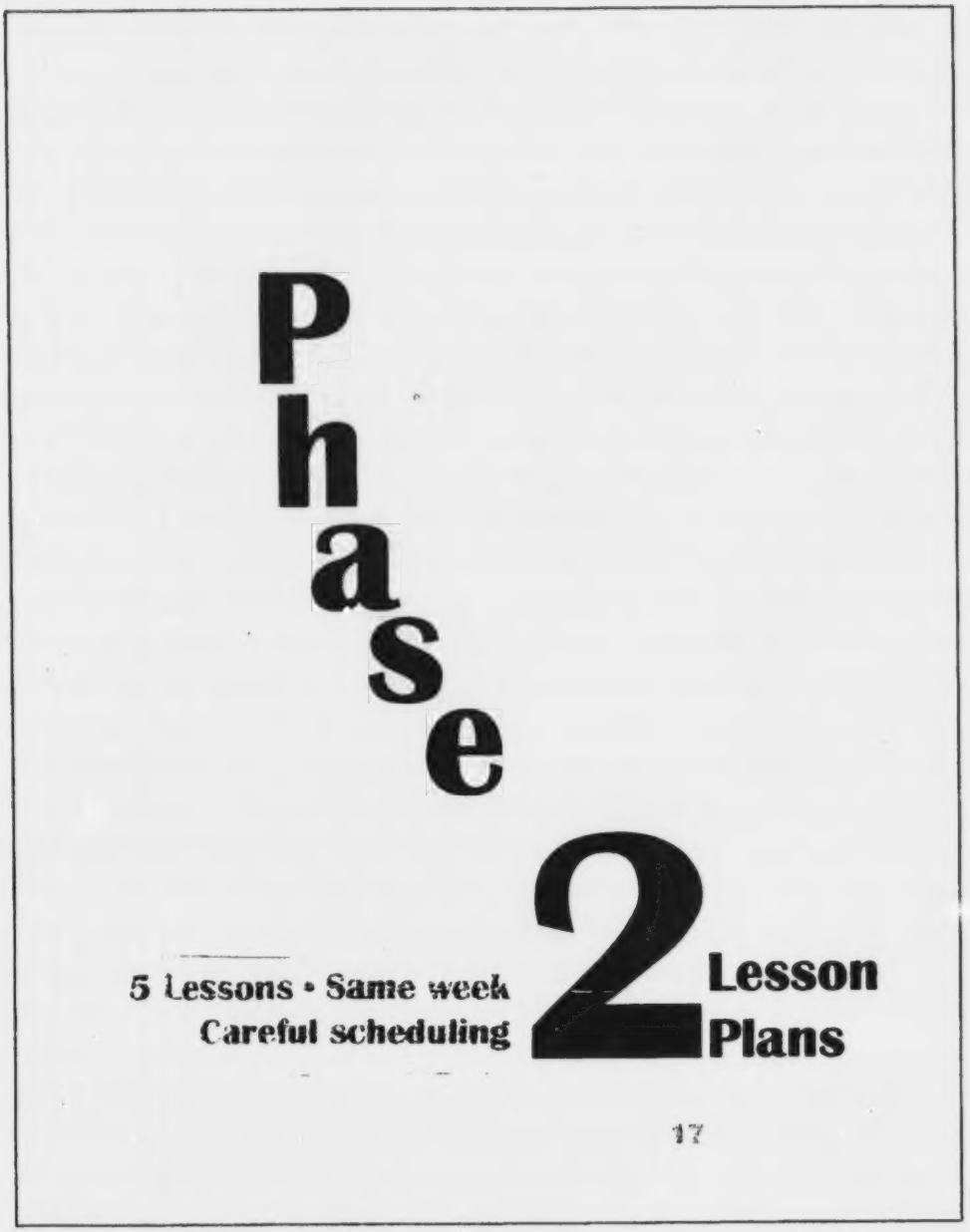

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To the teacher...

For the second phase of this instructional program in which the students learn the fingering patterns, this curriculum draws heavily on the work of Diana Hanbury King as presented in her elegantly simple book "Keyboarding Skills: All Grades". That book is recommended as a supplement to this material.

Though others besides King have espoused introducing the letter keys in alphabetic order, King's method includes two other features that have helped this author's own students significantly. The first is the use of oral spelling while initially learning the keys; the second is the use of a mnemonic poem to help students recall fingering patterns.

Here are the important points teachers should understand about using these techniques, in King's own words:

> *This method teaches an alphabetic sequence with simultaneous oral spelling. The student presses a key while naming the letter out loud, thereby establishing a conditioned reflex; eventually, naming the letter will cause the finger to move automatically. In many instances, the entire alphabet can be mastered in less than an hour.*
>
> *The following points are important to the success of this method:*
>
> *1. Once students have located a letter and practiced pressing it a few times, they should not look at their hands. In the case of computer typing, their eyes should be fixed on the monitor.*
>
> *2. Naming the letter aloud is vital to success.*
>
> *3. Once a letter other than a home key has been pressed, students should quickly return to the home keys. Suggesting that all the other keys are "hot" and that the fingers must be removed quickly to avoid burning them will give students the right idea.*

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4. Suggestions as to correct posture, wrist, and finger position are best made incidentally as the need arises. Too many instructions at first can prove discouraging.

5. Keep saying to your students, "Don't look; say the letter, and your brain will tell your fingers."

6. After the first few days, the keys should be covered. Use tape or a dab of nail polish. [see sidebar]

7. Once students have mastered the alphabet, they will need daily practice to develop speed and accuracy. Accuracy is best developed by practicing short words. Students tend to want to correct their errors, especially if they are using computers. However, it is best at first to encourage them to ignore mistakes and to keep practicing a sequence until they have done it correctly a number of times.

Keyboarding Skills: All Grades
by Diana Hanbury King
© 1986; reprinted 1997.

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http://www.epsbooks.com

Credit is also due to Joyce Steeves, the original author of the mnemonic poem in King's book. The poem used in Phase 2 of this guide is based on hers—though more finger designations have been added and other minor changes. This version may not be an improvement over her original!

Prevent looking? Small round labels available at office supply stores will work to cover the letters on the keys. However there is controversy among keyboarding instructors as to whether covering the keys is necessary or helpful to the learner. Some keyboarding instruction experts decry covering the keys ever; others insist upon it throughout instruction. Some block visual access to the keys or fingers occasionally but not routinely. Simple methods such as occasionally taping a piece of paper so it covers the hands can help students realize they do not NEED to look. Some students really appreciate this. Covering the keys should be considered a temporary crutch in any case. If you have the budget for them, check out the product called "Spondshine" listed in the Additional Resources section.

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Phase 2 • Fingering Boot Camp
Lessons 4, 5, 6, 7, 8

Fingering "Boot Camp"

This is the **BIG** week! Students will learn how to strike all the letter and major punctuation keys by touch from the home position. The objectives, preparation, instructional methods and student activities are the same for each letter. These lessons should all be given in the same week. If possible, allow students a 15 minute additional practice time each day. This should NOT follow immediately after the lesson however—it should be separated by at least a recess time. This additional period can also allow you time to work individually with any students are really struggling, or who have been absent and missed a previous lesson.

Objectives for the week

Students will learn correct fingering for all the letter keys, the comma, period, semicolon, and apostrophe keys. They will learn how to use the shift key for capital letters, the question mark, exclamation mark, and quotation mark keys. They will demonstrate proper posture and keystroking technique.

Preparation

Before each lesson practice the keys to be introduced that day. Learn the appropriate verse of the fingering poem. Have ready:

- wall chart where all students can see it as you demonstrate fingering.
- class practice record chart posted
- transparencies:
  - posture/finger position illustrations
  - the fingering poem; separate verses for each lesson
  - practice copy (printed copies optional—see sidebar)

Students will use the practice copy more than once. Some teachers have students make keyboarding folders, in which they keep track of their own practice material. Others prefer to set up a shared file system where students can access individual pages as needed.

Explain and show

Each day students will learn a section of the alphabet and one or two punctuation marks. Use the same procedure for introducing each key—follow the steps in the next section—"Introducing Letters". Then have students practice each new key individually, copying the practice lines while

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Phase 2 • Fingering Boot Camp
Lessons 4, 5, 6, 7, and 8

you circulate and monitor posture and technique. During separate practice time, students should independently review all the keys they've learned so far, while you circulate and monitor posture and technique. **Whether or not you are able to allow the additional 15 minute practice time each day,** devote the last 5 minutes of each lesson period to a review of all the letters learned so far. Do *not* do this at the beginning of the lesson.

Students do

Students follow your direction as you introduce each new key. They should verbalize each letter quietly to themselves as they strike it. After all new letters for the day have been introduced, they should practice independently—have them key the practice lines (masters included) that you either display using the overhead projector, or provide as printed handouts. Remind students that it will help their muscles memorize the strokes if they name each letter aloud as they strike it. Continually remind them not to look at the keyboard; they are learning to ***touch***-key, not sight-key.

Students who finish quickly should redo the lines—challenge them to go faster each time. Students should NOT correct mistakes while practicing. See sidebar.

Should students correct their errors?
Students should *not* correct their mistakes when they are copying practice lines. You will need to emphasize this! When they notice a mis-stroke, they should stop and feel for the correct key. When they locate it, they should practice it 3 times while *watching* the finger; then three times without looking—making sure to *return fingers to home position after each stroke.* Then they may resume the practice line. Stress that the mistakes they make are important clues to the keys they need more practice with.

Their goal at this point is *not* perfect lines on the screen; their goal is accurate keystroking *by touch.*

The only way to meet this goal is through practice, and mis-strokes are the guides each student should use to focus attention to the specific practice they need.

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Phase 2 • Fingering Boot Camp
Lessons 4, 5, 6, 7, 8

Introducing the keys

1. Students locate the key on their keyboards first by looking. Ask them to place their hands in home position, recall the QWERTY fingering pattern and figure out which finger controls the new key. Have all students hold up and point to the finger to be used.

2. Demonstrate the keystroke using the wall chart. Stroke should be quick—staccato. Avoid bouncing or extending the other fingers—aim to keep other fingers still. If the key is not a home key, the finger should return to its home key promptly after each stroke. (One way to emphasize the quick staccato stroke is to have kids imagine the the keys are HOT.)

3. Dictate the new letter at a slow pace and direct students to strike the key as it is called. They should look and watch the finger as it strikes the key (and as it returns home, if necessary). They should name the letter aloud to themselves as they strike it. (Explain that this will help their brains connect the concept of the letter with the finger muscle motion they use to strike it.)

4. Direct students to keep their eyes on you now, and strike the key as you dictate. After a few strokes, have them check to see if they are keying the right letter. Then have them "Go Home" (without looking). Pace them again. Have them check. Do this several times.

5. Remind students to check thumb position on the space bar.
   Dictate while students keep their eyes on you, saying:
   [letter]—space—[letter]—space— ...
   If the new letter is not a home key, say:
   [letter]—hop back home—space —[letter]—hop back home—space...

6. As you introduce the letters from each line of the poem, have students say that line with you, keying each letter as they say it. They should memorize one verse each day this week.

7. Have students individually copy practice lines, either from the overhead transparency or printed copies. Conclude with all letters learned so far.

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Lesson 4

Left hand letters:
A B C D E F G (and period)

The first seven letters of the alphabet are all keyed with the left hand.

Introduce each letter individually. Use the transparency, revealing each line as you introduce those letters. After you introduce all the letters in each line of the poem, have students recite the line with you, striking the letters as they name them.

"The touch-key alphabet is easy for me.
Little finger A, reach pointer for the B
Same finger, middle finger C, D, E
Side by side with pointer, F and G."

Introduce the period key, which is keyed with the right ring finger and is a bit tricky. Have students keep their anchor key on it's home, and tuck-pivot the ring finger down to tap the period. Have students key as you dictate:

a. b. c. d. e. f. g. [return]

Give students the practice lines to work on individually.

New Key Lesson Outline:

- Students find the new key by looking, and identify the finger to be used.
- Teacher demonstrates the stroke.
- Students practice (paced by teacher) while looking.
- Students practice (paced by teacher) without looking.
- Students touch-key from dictation, mixing the new letter with spaces.
- Students touch-key the new letter with earlier ones, saying the poem.
- Students touch-key practice lines individually while teacher checks technique.
- Students individually review all letters learned so far.

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Lesson 5

Right hand letters
H I J K L M N O (and comma)

The next eight letters of the alphabet are all keyed with the left hand. (Nine actually, but save the P for the next lesson.)

Introduce each letter individually. Use the poem transparency, revealing each line as you introduce those letters. After you introduce all the letters in each line of the poem, have students recite the line with you, striking the letters as they name them.

"Pointer finger H, middle finger I,
J, K, L are at "home", side by side.
Reach M and N with pointer down below;
Use ring finger to reach up for O."

Introduce the comma key, which is keyed with the right middle finger. Have students key as you dictate:

h, i, j, k, l, m, n, o, [return]

Give students the practice lines to work on individually.

New Key Lesson Outline:

- Students find the new key by looking, and identify the finger to be used.
- Teacher demonstrates the stroke.
- Students practice (paced by teacher) while looking.
- Students practice (paced by teacher) without looking.
- Students touch-key from dictation, adding the new letter with spaces.
- Students touch-key the new letter with earlier ones, saying the poem.
- Students touch-key practice lines individually while teacher checks technique.
- Students individually review all letters learned so far.

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Lesson 6

Both hands
P Q R S T U V (and apostrophe)

The next seven letters of the alphabet use both hands.

Introduce each letter individually. Use the poem transparency, revealing each line as you introduce those letters. After you introduce all the letters in each line of the poem, have students recite the line with you, striking the letters as they name them.

"BOTH hands now, here we go.
P and Q with pinkies, up a row.
Pointer-Ring-Pointer for R-S-T.
Right pointer up for U; left down for V."

Introduce the apostrophe key, which is keyed with the right little finger. Have students keep their anchor key on it's home, and reach out half way to the return key. Have students key as you dictate:

p's r's t's n't [return]

Give students the practice lines to work on individually.

New Key Lesson Outline:

- Students find the new key by looking, and identify the finger to be used.
- Teacher demonstrates the stroke.
- Students practice (paced by teacher) while looking.
- Students practice (paced by teacher) without looking.
- Students touch-key from dictation, using the new letter with spaces.
- Students touch-key the new letter with earlier ones, saying the poem.
- Students touch-key practice lines individually while teacher checks technique.
- Students individually review all letters learned so far.

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Lesson 7

Both hands
W X Y Z (and review entire alphabet)

The last four letters of the alphabet also require both hands.

Introduce each letter individually. Use the poem transparency, revealing each line as you introduce those letters. After you introduce all the letters in each line of the poem, have students recite the line with you, striking the letters as they name them.

"Both hands again for what comes next.
Ring up for W; ring down for X.
Right pointer reach for Y; left pinkie tuck for Z
Now I know them all you see!"

Have students read and key the entire alphabet with you several times. Walk around observing where trouble spots are, and spend some time reviewing sections of the alphabet that cause problems.

Give students the practice lines to work on individually.

New Key Lesson Outline:

- Students find the new key by looking, and identify the finger to be used.
- Teacher demonstrates the stroke.
- Students practice (paced by teacher) while looking.
- Students practice (paced by teacher) without looking.
- Students touch-key from dictation, mixing the new letter with spaces.
- Students touch-key the new letter with earlier ones, saying the poem.
- Students touch-key practice lines individually while teacher checks technique.
- Students individually review all letters learned so far.

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Lesson 8

Shift for capital letters
(and question mark, quotation marks, exclamation point)

Students now have learned all the letters, and the period, comma, and apostrophe keys. Now they will learn how to use the shift key to make the capital letters and the punctuation keys which require the shift.

Explain and show
The shift key is the most important of several "modifier" keys on the keyboard. The modifier keys change (modify) what the other keys do. Have students visually locate the shift keys. Can any student explain why there are *two* of them? It is so that either little finger can shift, depending on which hand will be used for the actual letter or punctuation mark.

Use the OPPOSITE hand little finger to shift. Capital letters ALWAYS require BOTH hands—one to operate the shift key, and the other to strike the key.

Modifier keys are not stroked quickly like the other keys. They are pressed down and held, while the letter key is tapped—then both fingers return to their home positions. Demonstrate this, using the wall chart.

Students do
Have students Go Home. Have them watch their little fingers as they reach for each shift key. They should notice that the shift keys are on the lower row, and the hand pivots slightly to reach it. All other fingers should remain steady at home. Have them watch their fingers while you dictate:

"Left pinkie shift—hold—return home.
Right pinkie shift—hold—return home."

Do this several times, slowly. Remind students to hold all their other fingers motionless. Now have them look at you while you dictate several more repetitions.

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Lesson 8 (cont.)

Guide students in keying capital letters, starting with the "anchor" keys (the keys with the bumps on your keyboards). Dictate, replacing the appropriate letter for the anchor keys:

"Left pinkie shift and hold—[right anchor key]—both fingers go home.
Right pinkie shift and hold—[left anchor key]—both fingers go home."

Now have them try other capital letters as you slowly dictate. Start with the vowels, and have them saying:

A is a left hand letter, so use RIGHT little finger to hold down shift—tap A—both back home.

E is a left hand letter, so use RIGHT little finger to hold down shift—tap E—both back home.

I is a RIGHT hand letter, so use LEFT little finger to hold down shift—tap I—both back home.

O is a RIGHT hand letter, so use LEFT little finger to hold down shift—tap O—both back home.

U is a RIGHT hand letter, so use LEFT little finger to hold down shift—tap U—both back home.

Introduce the **question mark.** It is keyed with the right little finger while the left little finger holds down shift.

Introduce the **exclamation point.** It is keyed with the left little finger with the right little finger on shift. Find it by feeling first for Q, and moving up in line from there.

Introduce the **quotation mark.** It is keyed with the right little finger while the left little finger holds down shift.

Now have students practice the whole alphabet in this pattern while you walk around and observe shift key technique:

aAa bBb cCc dDd...

Some students may have already become accustomed to using the caps lock key for making capital letters. It is important to break this habit. Point out that using caps lock requires an extra stroke for every single capital letter—it must be tapped once to lock it on, and tapped again to unlock it—three strokes instead of two for each capital letter.

The caps lock key is used only for 3 or more capital letters in a row.

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Phase 3

Skill building - Skill use
Flexible scheduling
3 to 5 times each week

Lesson Plans
& Integration Ideas

29

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Building "Muscle Memory"

This third phase of instruction will continue indefinitely as students build skill. To be successful, students must key 30 minutes daily for the first four weeks of Phase 3, and at least 3 times each week throughout the entire first school year in which they learn the skill. Scheduling of this keyboarding time is very flexible however. This is *not* time withdrawn from other curriculum areas. *ANY writing task can provide the major portion of this practice time.*

Students should begin each keyboarding session by keying the alphabet as quickly as possible two or three times *by touch*, and then copy one of the 10 brief practice exercises (masters included). This "warm-up" review period should only take 5 to 10 minutes total. It is not critical that students finish a practice page in each session—it is more important that they move on to project work after no more than 10 minutes whether they have finished a practice page or not. The practice exercises serve to review all the letter reaches. The order in which students do these practice drills is unimportant. They can resume where they left off the previous day, and keep track of progress on either an individual or the class progress chart. Students spend the rest of the time allowed for keyboarding making use of their keying skills to produce work *which is required in keyed form* for another subject area.

Teacher preparation time throughout phase three is largely in planning suitable writing tasks which students will be able to complete successfully at their level of skill.

Once every week or two, guide students in speed sprints. Overhead transparency masters with sentences that use all letters of the alphabet are provided for these sprints. Allow students 3 minutes to practice, then do 2 one-minute timings, and 2 two-minute timings.

During the early weeks of phase three, it is absolutely ***crucial*** that the teacher monitor student technique during practice times. Once proper techniques are firmly established, monitoring may be sporadic.

~ • ~

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Objectives for Phase Three
Through regular monitored practice, students will gain "automaticity"--the ability to touch-key without conscious thought to the mechanics of keystroking. They will at the same time accomplish keyed work for other subject areas using their growing skill.

This level of skill requires between 15 and 25 *total* hours of practice time depending on the individual. After phase two of this program, students will have just 2.5 to 3.25 hours of that total. They will require practice periods of 30+ minutes three to five times each week in order to maintain their ability to key by touch and grow steadily toward automaticity. These practice periods will consist of short daily reviews of the keys (5 to 10 minutes), and projects in which students key work from other subject areas.

Preparation
Planning pages are included as part of this package to be used by the teacher in scheduling and keeping track of student keyboard time. Teachers should use these pages in advance of each week to plan projects and assignments for students to key that are appropriate to their skill level, and that will serve them in their learning of subject matter curriculum. There is a place on each page to keep track of weekly and cumulative student practice time. The cumulative time figures will provide marker times for assessment of skill development.

Explain and Show
Establish routines for the keyboarding sessions and go over these routines with students. Some teachers will prefer allowing students to work through the 10 practice exercises at their own pace (keeping track themselves of their progress on a class chart the teacher can refer to); others may prefer to have the class work on the same practice exercise together each day. The practice exercises may be repeated as often as necessary, but in rotation—even if students have trouble with one exercise, they should move on to another, and return to the troublesome lesson later.

more » »

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Circulate among the students during the alphabet review and practice time, watching and correcting technique and posture. This is very important, as any bad habits they are forming will be difficult to break if allowed to "set" during these crucial skill-building weeks. After the fourth week, students can do alphabet warm-ups and skill-building practice without constant supervision, *but you must make sure they are on the right track to touch-keying before allowing un-monitored practice.*

After no more than 10 minutes warm up review and practice time, have students switch to the project work you've planned.

Students do

Students start each session by reviewing the entire alphabet *by touch*. They may say the poem quietly to themselves as they key the letters, or simply name each letter quietly as they key it. They should keep their eyes on their keyboard screen. When they make a mistake, they should *not* delete the error, but they should locate and key the correct letter 3 times while watching the finger make the stroke and return to its home position; then 3 more times without looking at the keys.

After this review of the alphabet, have students copy one of the short practice exercises, concentrating on keeping their eyes on the overhead or printed page (whichever works best in your class environment). Ten different practice exercises are provided in the form of 2-up black line masters. These feature different letters and punctuation marks, and assure that students get adequate practice on each character at a time when they can concentrate on *keying by touch*, and not fret about errors. The masters can be used to print copies for students to use individually, or to make overhead transparencies for the whole class to work on together. It is easier to tell whether students are looking at their fingers when the copy material is projected. Use what works in your situation. Students may use the class project chart (or individual charts if you prefer) to keep track of how many times they copy each exercise.

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Remind students to "trust their fingers". They should say the letter and let the finger find the key.

After 5 to 10 minutes of practice, students should switch to project work. You may have them do any writing task that they would otherwise be doing by hand. Some examples:

- practice spelling words in a list (great for Return/Enter key practice)
- use spelling words in complete sentences
- list vocabulary words from current reading
- use vocabulary words in new sentences
- compose a paragraph using descriptive adjectives
- write a poem
- write out how to do a math skill they are learning
- explain a science concept from a current lesson
- write a penpal from a state or country they are studying
- write a letter to a parent

... the possibilities are endless!

Have them concentrate on keeping their eyes on each word they are copying as they key it—they should not look at the screen to check their work until the entire word is keyed, even if they think they may have made a mistake. After keying a word, they should check for accuracy, and then use arrow and backspace/delete key to make corrections if necessary (using the correct fingers of course!).

It is up to you whether you have students print the work they do during these sessions, and it will depend in part on the nature of the task. Seeing and sharing work in "hard copy" is very motivating for students, but it can be time consuming—this depends on how easily your keyboard models connect to the printers or computers in your classroom, and how many stations are available. Since actually producing finished work is one of the goals of the keyboarding instruction, it is important to enable this at least some of the time, though it is not necessary to routinely print all practice work. Here are

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some printing options to consider:

- Allow a different group of students to print their own file each day, making sure each student gets to print perhaps once a week.
- Have your class "computer experts" handle the printing from *all* the keyboards at a convenient time. It's a good idea to rotate this task as you do other classroom responsibilities, so that all students have a chance to become experts. When it's time to rotate, each expert trains the next person.
- You might be able to take the keyboards to the computer lab and let your students all print their work there once a week. This works great, if your school has a lab situation that will easily handle printing from the portables.

Some keyboarding tasks will be first drafts of work that will need to be completed using a word processing program in which students can apply formatting. It is important that they NOT try to do any formatting (such as centering lines) in the initial keyboarding phase using the portables. That should all be done at the computer word processor because line lengths and character sizes on the portables are not always the same as on a computer screen.

It will help to do a demonstration of this with your students. Create a file on a portable in which you center a title line by using spaces, and begin a paragraph with an indented first line. Upload this file to a computer. Is the title still centered? (If it is, it will be only a lucky coincidence!) Now, on the computer, "select all", and try some font and size changes. Does the title stay in the same place? Unless you use the alignment centering function of the word processor, it will NOT stay centered when the character size changes.

The computer is the tool for text formatting; the portable keyboard is an extension of the computer which can be used anywhere, but it is for keyboarding, not formatting.

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Schedule three to five 30-minute sessions.

~ • ~

Plan relevant keyboarding tasks suitable to skill level.

Sample Weekly Plan

MONDAY April 3-7

10-10:30 Spelling list; each word 3 times on a line; then words in complete sentences if time.

WEDNESDAY

1-1:30 Write descriptions of cloud types to caption their drawings for the weather wall display.

TUESDAY

9:30-10:00 Students write out the steps they follow to multiply fractions.

THURSDAY

2:00-3:00 Write thank-you notes to Parents' Club. (Upload, proofread, edit, and print these. Not all time will be keying—figure 30 min.)

FRIDAY

11-11:30 Descriptive paragraph writing. "Describe a lightbulb" assignment

---

Keyboard hours this week: 2.5 TOTAL practice time to date: 13.5

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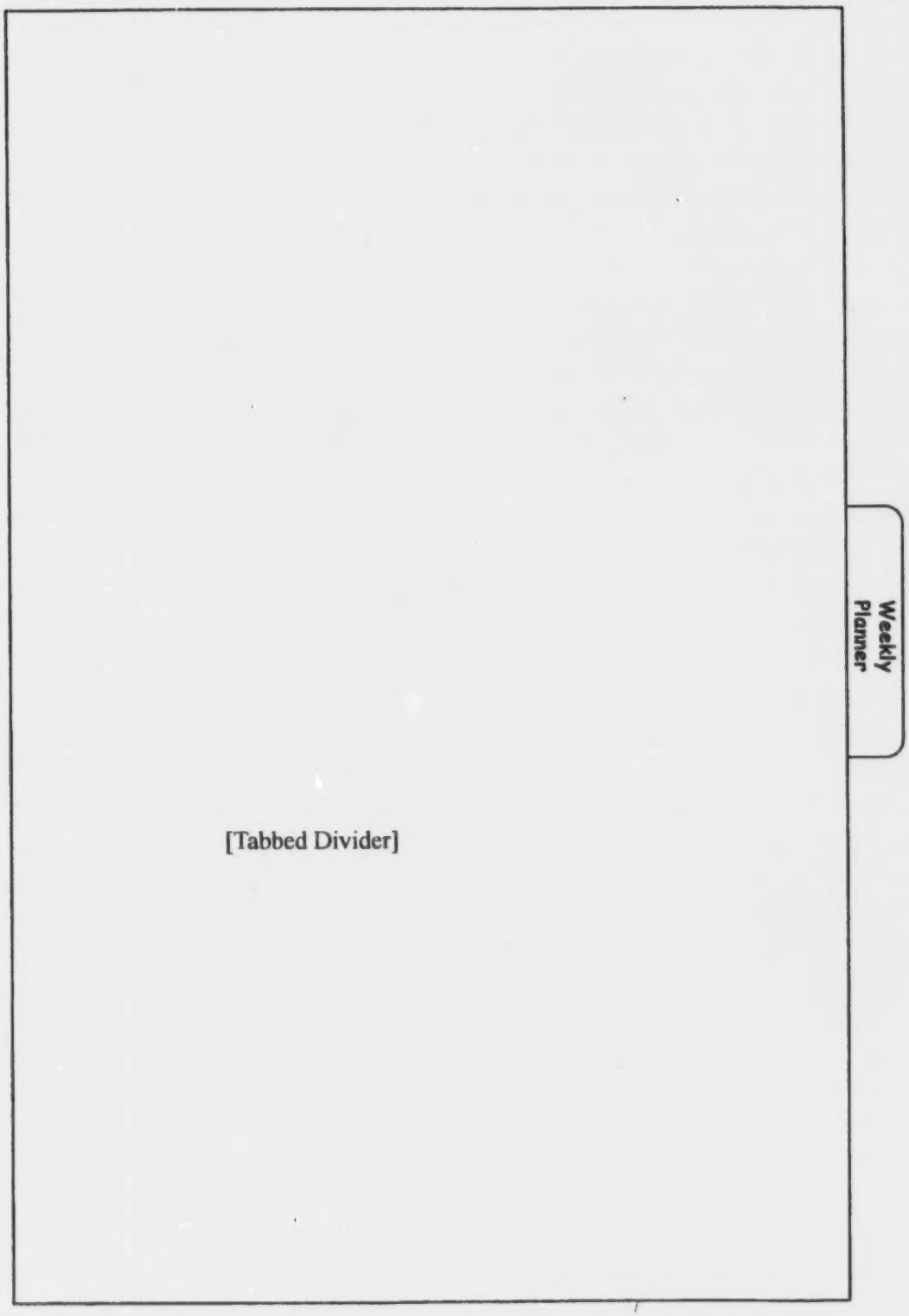

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Schedule three to five 30-minute sessions.

~ • ~

Plan relevant keyboarding tasks suitable to skill level.

MONDAY _____

TUESDAY

"There is no longer a question as to whether elementary school students will be using microcomputers. The question remaining is, "Will elementary school students be taught keyboarding so they can operate the microcomputers efficiently?"

~ Carolee Sormunen

Teaching Keyboarding: Instructional Practices of Elementary School Teachers

WEDNESDAY

THURSDAY

FRIDAY

Keyboard hours this week: _____ TOTAL practice time to date: _____

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Schedule three to five 30-minute sessions.

~ • ~

Plan relevant keyboarding tasks suitable to skill level.

MONDAY

TUESDAY

"Today, keyboard skills in many schools stands polarized between the new tokenism and the old vocationalism, neither of which can be said to meet the needs of young people. What is required is a systematic approach to the development of efficient text input skill in all pupils on entry to secondary school, reinforced through application across the curriculum and over time. Resistance to the need for systematic keyboard skills training for all is often couched in terms of convenience or avoidance."

Eve Gillmon

Keyboard Proficiency: An Essential Skill for a Technological Age

United Kingdom

WEDNESDAY

THURSDAY

FRIDAY

Keyboard hours this week: _____ **TOTAL practice time to date:** _____

Schedule three to five 30-minute sessions.

~ • ~

Plan relevant keyboarding tasks suitable to skill level.

MONDAY

"Teaching students to keyboard, and then failing to provide adequate reinforcement and application opportunities is somewhat like teaching students to read and then not providing books, opportunity, or motivation for them to read afterwards."

TUESDAY

"Teachers at the grade level where keyboarding is introduced—and at all levels above, no matter what subject they teach—should be trained to provide reinforcement activities wherever computers or typewriters are used in the curriculum."

Elementary/Middle School Keyboarding Strategies Guide

National Business Education Association

WEDNESDAY

THURSDAY

FRIDAY

Keyboard hours this week: _____ TOTAL practice time to date: _____

Schedule three to five 30-minute sessions.

~ • ~

Plan relevant keyboarding tasks suitable to skill level.

MONDAY

"Keyboarding instruction is an investment in more efficient learning. I think the scale tips in favor of teaching keyboarding before grade six. The advantages are:

- more efficient student use of computer time;
- focused attention on the task to be accomplished, rather than on keyboarding mechanics;
- early learning and accomplishment of touch-typing technique."

Keith Wetzel

Keyboarding Skills: Elementary My Dear Teacher

The Computing Teacher

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

Keyboard hours this week: _____ TOTAL practice time to date: _____

BEST COPY AVAILABLE

Schedule three to five 30-minute sessions.

~ • ~

Plan relevant keyboarding tasks suitable to skill level.

MONDAY

TUESDAY

"The time and effort required to learn efficient keyboarding skills is not insignificant. Keyboarding across the curriculum can help to amortize that investment, while at the same time enhancing student performance on existing objectives."

James DeLoach

Individualized Instruction: An Alternative Approach to Keyboarding

WEDNESDAY

THURSDAY

FRIDAY

Keyboard hours this week: TOTAL practice time to date:

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Schedule three to five 30-minute sessions.

Plan relevant keyboarding tasks suitable to skill level.

MONDAY

"If initial training is to be reinforced effectively, the keyboard must be used in all curriculum subjects. As with any cross-curricular skill or dimension, it must be accepted as a responsibility of all staff members. This implies conscious acceptance of its worth as a life-skill for young people who will be living and working in a technological age, a recognition of its complexity, and a commitment to vigilance and supervision in the interests of the pupil's skill development."

Eve Gillmon

Keyboard Proficiency: An Essential Skill for a Technological Age

United Kingdom

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

Keyboard hours this week: TOTAL practice time to date:

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Schedule three to five 30-minute sessions.

~ • ~

Plan relevant keyboarding tasks suitable to skill level.

"Keyboarding instruction is most effective and useful when it is explicitly integrated with activities in reading, writing, and spelling. The key to this integration is rapid movement from emphasis upon the motor tasks involved in finger movement to the use of these skills in meaningful activities in the language arts program. Unfortunately, touch-typing teachers have long assumed that beginners must be limited to work that requires only the use of keys that have already been mastered to prevent the habit of looking at the keyboard. While this teaching technique may be appropriate for the typical typing student of the past—a teenager or adult who is already language proficient—it is not appropriate for elementary learners, as it fragments the keyboarding task from language. Integrative instruction is more important at the elementary level than good secretarial habits."

Ernest Balajthy

Keyboarding, Language Arts, and the Elementary School Child

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

Keyboard hours this week: TOTAL practice time to date:

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Schedule three to five 30-minute sessions.

~ • ~

Plan relevant keyboarding tasks suitable to skill level.

MONDAY

"It is significant to note that the experimental pupils did not suffer any academic loss between classes even though part of their school time was devoted to learning and to developing the skill of typewriting."

Wood and Freeman

An Experimental Study of the Educational Influences of the Typewriter in the Elementary School Classroom

1932

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

Keyboard hours this week: _____ TOTAL practice time to date: _____

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Schedule three to five 30-minute sessions.

~ • ~

Plan relevant keyboarding tasks suitable to skill level.

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

"My daughter "did keyboarding" in the fourth grade. She did keyboarding in the same way she did Oregon history, the life cycle, and the solar system: as a separate subject, divorced from any meaningful context. Subsequent to her keyboarding instruction there hasn't been a single school activity requiring the skills she worked hard to develop. My daughter is now in the sixth g[illegible] It has been two years sinc[illegible]he "did keyboarding" and still she has not been asked to apply her keyboarding skills either during class time or out of class for a school assignment."

Lynne Anderson-Inman

Keyboarding Across the Curriculum

Keyboard hours this week: TOTAL practice time to date:

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Schedule three to five 30-minute sessions.

Plan relevant keyboarding tasks suitable to skill level.

MONDAY

TUESDAY

"There is a hierarchy of sensory input to the brain. Sight takes precedence over touch, and sight-learning tends to extinguish touch-learning. Thus, students who learn to type by sight (the hunt-and-peck" method) suppress their abilities to learn to type by touch. If students practice typing by looking at their fingers, they aren't learning anything. The more students look at their fingers, the more they have to look at their fingers. (adapted from a source called Softalk, June 1984, by John R. Thach. Please Touch: Toddlers and Typing)

WEDNESDAY

Alaska Dept. of Education

Teaching Keyboarding

THURSDAY

FRIDAY

Keyboard hours this week: _____ TOTAL practice time to date: _____

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Schedule three to five 30-minute sessions.

Plan relevant keyboarding tasks suitable to skill level.

"Although some fear that keyboarding training might detract from students' handwriting skills, the reverse appears to be true. Lawrence Erickson's research showed that typewriting instruction with an experimental group of fifth grade students 'had a highly favorable effect, as measured by the Ayres Handwriting Scale, upon both quality and the speed of handwriting.' The experimental group, keying most of their written work during a five-month period, made greater improvement than the control group in the quality and speed of their handwriting."

Elementary/Middle School Keyboarding Strategies Guide

National Business Education Association

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

Keyboard hours this week: _____ TOTAL practice time to date: _____

BEST COPY AVAILABLE

Schedule three to five 30-minute sessions.

~ • ~

Plan relevant keyboarding tasks suitable to skill level.

MONDAY

TUESDAY

"The first step must be to develop a policy on keyboard usage which encompasses all students, all staff members and all curriculum subjects. If keyboard skills continue to be seen as a mere adjunct to the Business Studies or IT curricula, or as an irritating distraction from the real business of another curriculum subject, then the simple objective of making every student keyboard-competent will not be achievable. Motivation depends greatly on recognition of the worth of the activity. Teachers and ancillary staff who themselves have not acquired, or do not attempt to acquire, skills of this nature will not convince students of their importance. In a technology-rich environment, schools and colleges should seek to promote efficient use of equipment at all levels, thus leading by example."

WEDNESDAY

THURSDAY

Eve Gillmon

Keyboard Proficiency: An Essential Skill for a Technological Age

United Kingdom

FRIDAY

Keyboard hours this week: _____ TOTAL practice time to date: _____

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Phase 1 · Intro Reproducibles

[Tabbed Divider with pocket for unpunched masters]

Lesson 1

Instructions: When your teacher tells you to begin, copy this carefully onto lined paper. Use a pencil, so you can correct any mistakes if you make them. Pretend that this will be displayed on your classroom wall as a sample of your handwriting—it must be NEAT and easy for others to read. Stop when you are told to stop.

Yoyo Day at School

We had a fun day at school last week. We got to see a guy do a lot of yoyo tricks. He was really talented. He said he has been practicing for years.

It is fun to play with a yoyo, but it takes time to learn the cool tricks. You have to practice a lot to do them well. It is fun to learn and fun to show off the tricks you can do.

Touch-keyboarding is like that. It takes time to learn, but it is great when you can do it. It helps you do work fast and neatly. It is easy to fix mistakes, so you can make your work perfect. I know that if I practice I will be able to keyboard by touch.

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Lesson 1 • word count guide

Yoyo |Day a|t Sch|ool | 4

We ha|d a f|un da|y at |schoo|l las|t wee|k. We| 12
got t|o see| a gu|y do |a lot| of y|oyo t|ricks|. He |was 21
r|eally |talen|ted. |He sa|id he| has |been |pract|icing| 31
for y|ears.| 33

It is| fun |to pl|ay wi|th a |yoyo,| but |it ta|kes 41
t|ime t|o lea|rn th|e coo|l tri|cks. |You h|ave t|o 50
pra|ctice| a lo|t to |do th|em we|ll. I|t is |fun t|o lea|rn 60
an|d fun| to s|how o|ff th|e tri|cks y|ou ca|n do.| 69

Touch|-keyb|oardi|ng is| like| that|. It |takes| time | 78
to le|arn, |but i|t is |great| when| you |can d|o it.| It 88
h|elps |you d|o wor|k fas|t and| neat|ly. I|t is | easy |to 98
fi|x mis|takes|, so |you c|an ma|ke yo|ur wo|rk 106
pe|rfect|. I k|now t|hat i|f I p|racti|ce I |will |be ab|le 116
to| keyb|oard |by to|uch. 120

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Lesson 2 - Hand chart /Fingering Quiz

Name: _____

What letter keys are controlled with the right **ring** finger?

_____

Which finger controls the **B** key?

_____

Which finger only controls **one** letter?

_____

Which finger controls the **J** key—the **right pointer** or the **left pointer**? _____

What letter keys are controlled with the **left middle** finger?

_____

Which hand controls the most **vowel** keys?_____

Circle the words that are keyed with **left hand fingers** only.

up rest at today
sweet of water the
with street winter

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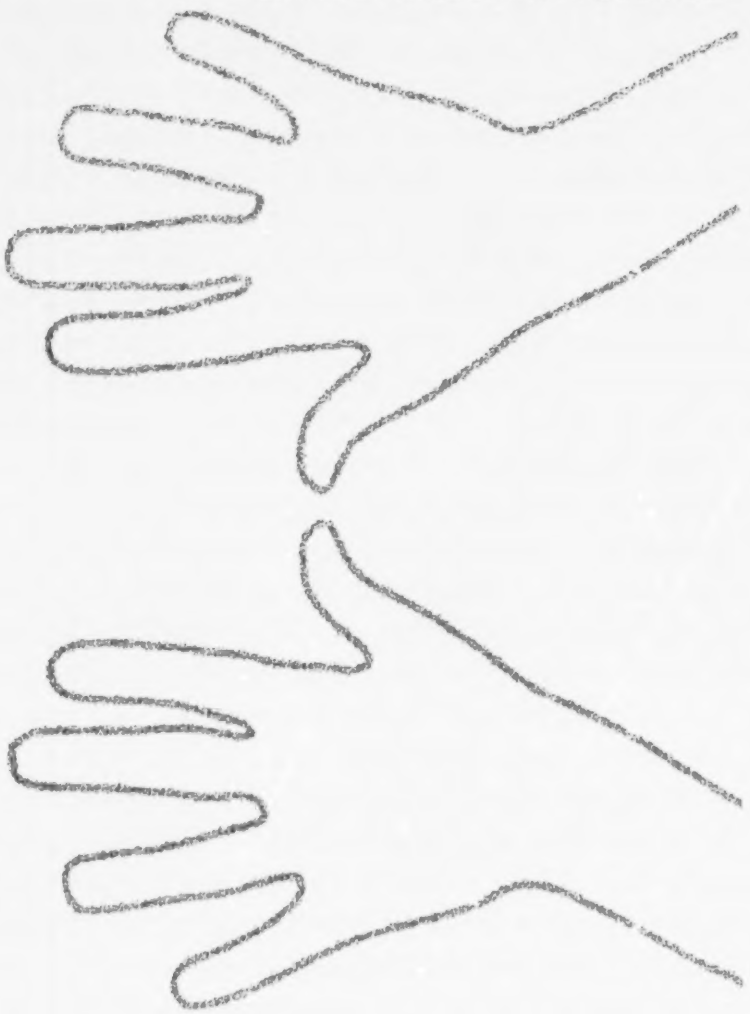
Lesson 2 • Hand chart /Fingering Quiz



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Lesson 3 • Worksheet (side 1)

Name: _____

"There's no place like home"

1. Turn the keyboard on and off. How can you tell if the keyboard is on? _____
   _____
2. Find the little bumps on the two keys that will be your "anchor" keys. The left hand anchor key is the letter _____. The right hand anchor key is the letter _____.
3. What finger will "live" on your left anchor key? _____
4. What finger will "live" on your right anchor key? _____
5. Line up your fingers on their "home row" keys, and rest both thumbs lightly on the space bar. This is your HOME position.

Do your hands look like this?

Notice how the fingers are curled.
Notice how relaxed they look—not stiff.

What are the two letters you see between your pointer fingers when your hands are in home postion? ____ and ____
Think "Go Home"when you see these keys!

Check your posture:

- Feet flat on the floor—
  not crossed.
- Elbows hanging straight down—
  not sticking out like wings.
- Wrists straight—
  not bent up or down
- Back straight—
  not slumping

Practice for the first great keyboarding skill test!
(Don't worry, it won't be graded)

Can you "Go Home" without looking?

First wiggle your anchor fingers around to get a good feel for these anchor bumps. Tap your pointer fingers together across the G and H keys to see how that feels. Feel the space bar with the sides of your thumbs. Memorize the feeling! Try without looking.

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Lesson 3 • Worksheet (side 2)

Experiment!

6. Spot the "caps lock" key, and press it with your left little finger. You should see something different on the screen when caps lock is on. Press caps lock again, and it will disappear. Do it on and off again. Describe what you notice on your screen that tells you caps lock is on.

   _____

   (Anytime you start getting capitals when you don't mean to, you have probably pressed this key.)

7. Go Home (without looking!) Press your right anchor key and hold it down until the letter fills the line and KEEP holding just a little bit longer. What happened? Where did the letters go after they filled the first line? _____

8. Go Home (without looking!) Press your left anchor key and hold it down until the letter fills the whole screen, and KEEP holding just a little bit longer. What happens when the whole screen is full? _____

9. Now and try this—while keeping your right anchor finger on it's home key, pivot your hand as you stretch the right little finger up to the delete (or backspace) key. Return to home position. Try it a few times to "get the feeling". Then reach the delete key and hold it down until the entire screen is cleared.

10. Go Home, checking to be sure your thumbs are resting lightly on the space bar. Now tap your left anchor key—then make one space with the right thumb—left anchor key—one space—left anchor key—one space—repeat until the letter is on the screen 5 times. (Tap quickly—don't hold down the key. Try to tap just one letter and one space at a time. Practice more if you need to.)

    If your left anchor key is D it will look like this: d d d d d

    If your left anchor key is F it will look like this: f f f f f

11. From home position, reach your right little finger straight over sideways and tap the return (or enter) key. Some keyboards label it "return"; some label it "enter", but it's always in the same place, and it does the same thing.
    What does it do? _____

12. Now practice with your right anchor key and alternate spaces. Again, use the right thumb on the space bar.

    If your right anchor key is K it will look like this: k k k k k

    If your right anchor key is J it will look like this: j j j j j

13. Turn off the keyboard. Turn it on again. Is your work still there? _____

14. What does the "home" key do? _____
    What does the "end" key do? _____

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Phase 1 & 2 • Transparency master

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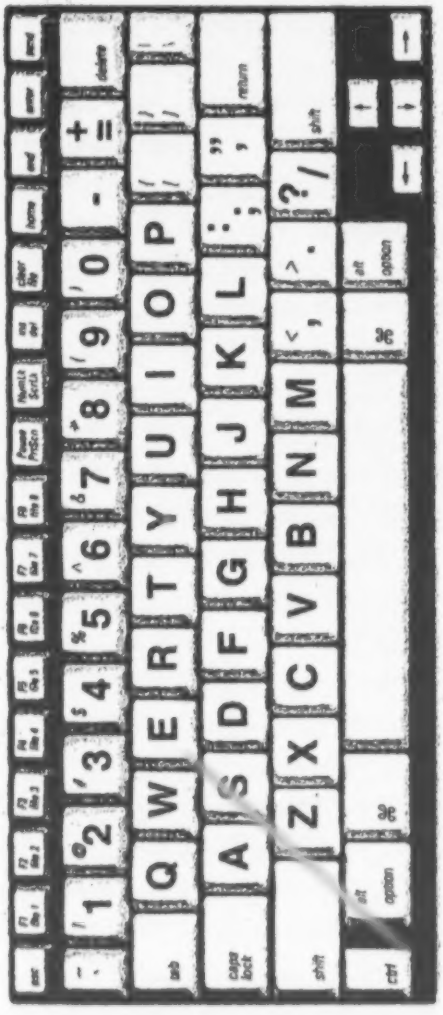
Phases 1 & 2 • Demonstration wall chart

(Copy at 150%, laminate)



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Phase 2 - "Bootcamp" Reproducibles

[Tabbed Divider with pocket for unpunched masters]

Phase 2 - Transparency master

The Touch-Key Alphabet Poem

The touch-key alphabet is easy for me.
Little finger A, reach pointer for the B
Same finger, middle finger C, D, E
Side by side with pointer, F and G.

Pointer finger H, middle finger I,
J, K, L are at "home", side by side.
Reach M and N with pointer down a row;
Use ring finger to reach up for O.

BOTH hands now, here we go.
P and Q with pinkies, up a row.
Pointer-Ring-Pointer for R-S-T.
Right pointer up for U; left down for V.

Both hands again for what comes next.
Ring up for W; ring down for X.
Right pointer stretch to Y; left pinkie tuck for Z
Now you have them all you see!

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The touch-key alphabet is easy for me!

Little finger A, reach pointer for the B

Same finger, middle finger C, D, E

Side by side with pointer, F and G.

Lesson 5 • Transparency master

Pointer finger H, middle finger I,

J, K, L are at "home", side by side.

Reach M and N with pointer down a row.

Use ring finger to reach up for O.

BOTH hands now, here we go.

P and Q with pinkies, up a row.

Pointer-Ring-Pointer for R-S-T.

Right pointer up for U; left down for V.

181 BEST COPY AVAILABLE

Lesson 2 - Transparency Master

Both hands again for what comes next.

Ring up for W; ring down for X.

Right pointer stretch to Y; left pinkie tuck for Z

Now I can do them all you see!

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Lesson 4 · A B C D E F G
(and period)

a a a a b b b b
aa bb aa bb
ab. ba. ab. ba.
cde cde edc edc
ab. cde. ab. cde. ab. cde.
edc cde edc cde
ba ab ba ab abcde. abcde.
fg fg fg gf gf gf
ab cde fg ab cde fg
gf edc ba gf edc ba
abcdefg. abcdefg. abcdefg.
gf edc ba. ab cde fg.

Lesson 5 · H I J K L M N O
(and comma)

hi hi hi, hi, hi,
jkl jkl jkl jkl
hijkl, hijkl, hijkl,
mn mn mn mn mn
o, o, o, o, o, ho, ho, oh, no.
man men no men
nine men, and one man.
a fine man
a good omen
hijklmno hijklmno
abcdefghijklmno
a b c d e f g h i j k l m n o

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Lesson 6 · P Q R S T U V
(and apostrophe)

pq pq pq pq pq
rst rst rst rst rst
rats star rats star
pqrst pqrst pqrst
uv uv uv vu vu vu
qu qu qu up up up
it's it's it's
isn't isn't can't don't
abcdefghijklmnopqrstuv
a b c d e f g h i j k l m n o p q r s t u v
ab's cde's fg's hi's jkl's mno's pq's rst's

Lesson 7 · W X Y Z
(and review)

w w w w x x x x
wax wax saw wax
ax ax axes six saxes
yz yz yz zy zy zy
was jazzy was jazzy
abcdefghijklmnopqrstuvwxyz
a b c d e f g h i j k l m n o p q r s t u v w x y z
ab cde fg hi jkl mno pq rst uv wx yz
abcdefg's hijklmno's pqrstuv, wxyz.
abcdefg, hijklmno, pqrstuv, wxyz.

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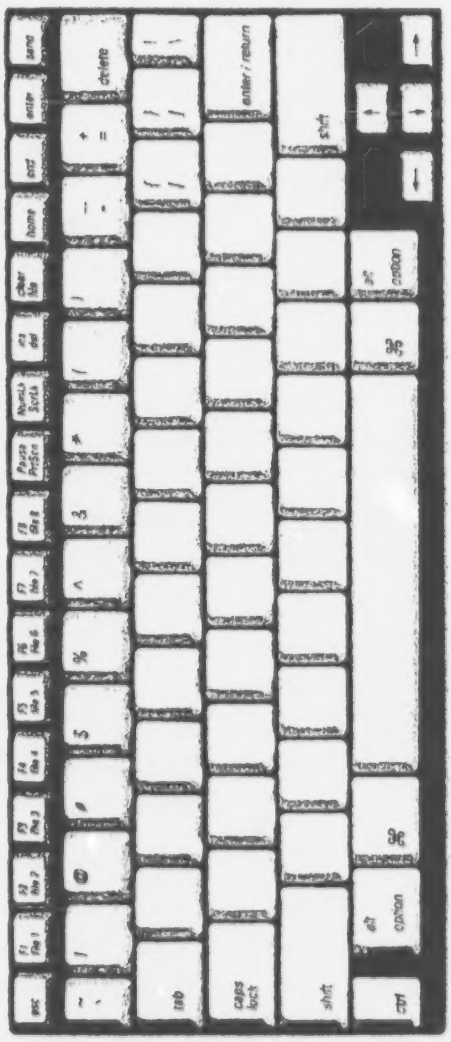

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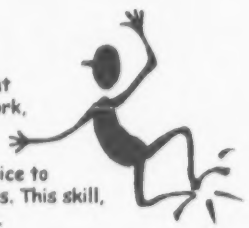
Hello Parents!



Your child is being taught computer keyboarding skills at school. Students will use these skills for their school work, and indeed, through all their lives. Keyboarding in the computer age is an *essential* communication skill for everyone. But it takes determination and hours of practice to learn to key *by touch*. Please support your child's efforts. This skill, if mastered now, will reward your child many times over.

If you have watched young children play video and computer games, you know that most kids have no problem learning to use game controls without looking at the controller or keypad. They can learn to touch-type just as well—though since there are more "controls" (keys) on the keyboard it requires training of *all* the fingers, which takes more practice time to master.

Typing is a cumulative skill; once the basic techniques are learned the skill grows through use, until it eventually becomes automatic. If students do not establish correct fingering when they first start to keyboard, they will develop two finger "hunt and peck" habits which are *very* difficult to break. This will limit their speed, they will be unable to type without watching their hands, and they will not reach the point where it becomes automatic. Though elementary students are not expected to type at the speed of office workers, it is very important to prevent development of bad habits. Since students are using computers at younger ages it is now important to teach the basics of ten finger touch keyboarding in the elementary grades.

If your student uses a computer or typewriter at home, we are asking for your help. The illustrations show what they are being taught about correct technique, posture and fingering.

Fingers curved

Forearm and wrist make a straight line; wrist is not bent.

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If you have a typing tutor software program, watch that students do not revert to using the wrong fingers just to "beat the game". Software can help them practice, but it can also be harmful—*no* software can detect *which* finger a person is using to strike a key!

I am looking forward to helping your student build skills that will serve him or her well for a lifetime!

Sincerely,

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Phase 3 · Integration
Reproducibles

[Tabbed Divider with pocket for unpunched masters]

Phase 3 • Record-keeping

(Copy at 200% for wall use)

Touch-Keying Progress Chart

Student Name	First WPM Speed Goal (the transitioning speed for the next speed goal)	Practice Exercises Completed (Test one each practice: mark it ✓ / Next time—change it to ⊠ / Third time—mark it ⊗ / Fourth time—fill in the circle ●)										WPM after 10 hours	WPM after 15 hours	WPM after 20 hours
		1	2	3	4	5	6	7	8	9	10			
prompts														
Jesse James	14	X	X	⊗	✓	●	⊗	⊗	●	✓	X	9	12	15
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Key by TOUCH

1

a a aa. o o oo oa d d k k
oar, oars, oats, soar, soak, soap, soda.
aAa dDd kKk oOo

A goat in a boat floats.

Dad had a bad day. Egad!
A glad lad isn't sad or mad or bad.

"OK."
Our koala got soaked in the oak.

a
o
d
k

Key by TOUCH

2

e e deed seed feed
i i is silk kids ski skid skill
eEe iIi lLl sSs

I like Ike. Lisa likes Sid. Eva is ill.

Kids ski with skill.
I see seals slide.

I said, "I like Lea's idea.
Let's eat boiled eels!"

e
i
l
s

Key by TOUCH

3

u u up us use under umbrella uncle
y y yes yesterday
yYy uUu

u

you your you're you've you'd

y

You're busy? You say it's your birthday?

You'd better buy your uncle an umbrella.

Ugly thoughts make ugly faces.

Key by TOUCH

4

c c cat catch check chick
g g h h gh gh rough tough hag hog
cCc gGg hHh Aargh!

g

Mickie kicks high.
Chuck laughs. Chester chuckles.
Chevana cracks up. Hector sighs.

c

h

right light sight might fight night tight bright

"I'm frightened!" she cried. "A ghost!"

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Key by TOUCH

5

f f r r t t fFf rRr tTt
fir fit far fat for fort fur
free first fast start forts forest frost

They had a free street fiesta.

Starlight frosts the forest trees.
Rats are fast. Rats frustrate cats.

The star students study first.
Start to study so you won't be last.

f
r
t

Key by TOUCH

6

m m n n man men w w woman women
mMm nNn wWw

Many men and women mean well.

A woman won money. A man won a new mower.
Who won the monkey wrench?
We'll know in a moment.

I want to meet the man in the moon at noon.
"Why?" my mom wonders.

m
n
w

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Key by TOUCH

7

v v b b fvf fbf eve bee beef beaver
by boy bay bossy baby bBb vVv

b

even ever every everyone everybody

v

Vivid verbs beat boring verbs every time.
Five baby boys have very bubbly vibes.

Vivian and Evan use vibrant nouns and verbs.
Bobby and Brenda blow beautiful bubbles.

Key by TOUCH

8

j j p p jump purple jalopy
jJj pPp Japan

j

p

Pick up Jasper's puppies in the junky pickup.
Judge Popham enjoys juicy purple plums.

qu

qu qu aqua quit quite equal qQu Que?

"Uh oh, a pop quiz!"
Just be quiet and do the project.
Quince pies and kumquats make me quite queasy.

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Key by TOUCH

9

x x ox fox box ax axle xXx
vexing vortex

x

z z zip zap zipper zZz
whiz fizz snazzy jazz

z

Six saxes sizzle; a kazoo fizzles.
Buy extra pizza at the next exit.

Zip to the zoo for the next zebra extravaganza.

Key by TOUCH

10

th th the this that these
those with other

th

there their they're
though, through thought

sh

Both the boys think they're the best.

sh sh she shoe shine shop wish wash

She's the one; she'll shake them up.

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